RAILROAD GAZETTE

FRIDAY, DECEMBER 18.

Car Shop Notes in Boston.

THE BOSTON & ALBANY CAR SHOPS.

The Boston & Albany car shops at Allston, some six miles from Boston, are situated in a long and narrow plot of land alongside the line. Though built 16 years ago, the shops have a very modern appearance, doubtless partly owing to their being remarkably neat and clean. The shops consist of several distinct brick buildings separated by an interval sufficiently large to minimize the risk of fire communicating from one shop to the next. The tracks run directly into the shops by means of switches laid out with sharp curves, no traverse tables being used.

The shops are not very busy at present, and are only working eight hours per day. Little new work is being done, but two new drawing-room cars have just been finished, and put on the New York & Boston service. These cars differ somewhat from the usual style of drawing-room car, having the Mann roof and the Mann system of ventilation, and being also considerably lighter than the ordinary form of car, weighing only 49,000 lbs., though 57 ft. 6 in. long over body. They accommodate in all 22 passengers.

Mr. F. D. Adams, the Master Car-Builder of the Boston & Albany, has introduced several improvements in the construction of the passenger cars on his road. The most important improvement is undoubtedly the great reduction of dead weight effected. An ordinary Boston & Albany day coach weighs about 600 lbs. per seat, while the usual weight is 750 lbs., and often exceeds this figure. Put in another form, a train of ten Boston & Albany cars will only weigh as much as a train of eight cars of the usual construction, and of the same capacity. This is a very important saving, and if, as seems probable, the lighter car is as durable as the heavy car and has a sufficient margin of strength, the smaller weight is an unmixed advantage.

Two ordinary passenger cars have just been commenced in the shops. The method of building passenger cars in these shops differs somewhat from the usual practice. The sills and flooring of the passenger car being put together, the roof is then built on the floor, and when finished is hoisted by blocks and tackles from the shop roof, and the sides are then built in their proper position. This does away to a great extent with the necessity of staging for the men to work on, and as the work is more accessible, it is estimated that the work can be done far more cheaply than by the ordinary method. The roof is very light, but is most carefully put together, the workmanship being excellent, the joints all fitting together with perfect accuracy. The ends of the carlines are made in two pieces placed side by side, glued together, and breaking joints so as to stiffen the angle. Eight iron carlines are used in the length of the car, and are provided with feet bolted to the plate. The roof is stiffened by the use of a wooden lining. Narrow hard-wood stuff about 2½ in. wide is tongued and grooved, and glued together to form a square, and the square is then secured to the carlines by steel brads. The finish thus produced is exceedingly neat, and does not show the smoke from the lamps as much as a canvas lining. While the wood lining costs more in the first instance, it is considered cheaper to maintain, as it only requires varnishing every twelve months, and will, of course, last as long as the car.

The corners of the roof are bound together by hollow castings, suitably rounded to the curves of the roof in end view and plan. The outer edge of the casting has several small holes cored in it, wooden pegs are driven into these holes and the tin is nailed into the pegs. It is claimed that the iron corners stand an accidental blow better than wooden corners, and are no more expensive. The deck lights are very carefully fitted, and sheet-copper flashing is used to prevent any wet getting at the joints and mortises.

The winter months are devoted to repairing the passenger equipment, and putting it into good condition for the summer traffic, when every car is wanted on the road, and cannot be spared for repairs. As a rule every passenger car goes through the repair shops once a year, and is thoroughly cleaned and varnished, and the panels, etc., are examined and repaired. The outsides of the cars are washed with water only at the stations, no soap or other detergent being used, lest the paint should be damaged. When the cars come into the shop, however, once every year, the bodies are washed with water and caustic soda, the solution showing a strength of 1 degree on the hydrometer. The trucks being very oily, a 2 or 3 degree solution is required for them. The washing must be done carefully even with weak solutions, as if not washed off with water soon after application, the paint is seriously injured. The caustic soda as made in the shop is of 12 degree solution, and is served out diluted to the proper strength by a man in charge, who keeps the solution under lock and key, so that the washers cannot unduly increase the strength of the mixture.

The truck check chains are arranged with a view of preventing the truck swinging round when the car is off the road, and are not primarily intended to hold the end of the truck up should an axle break. The check chains nearest the ends of the car are secured to the two centre sills, instead of the side sills as usual. The chains are hooked to a stout iron strap 3 in. × ¾ in. passing over the centre sills and bolted firmly to them. The check chains nearest the centre of the car are secured to a plank running across the car and secured to all the sills. In case the car leaves the road, the length of the chains, by actual test, will just allow the wheels when off the track (on a tangent) to run on the ties just clear of the rails. The chains are also just long enough to allow the cars to go around any curve traversed in daily service. The chains, however, have to be unhooked to allow the cars to be brought into the shop, as the curves are very sharp. When taut the chains are nearly horizontal, and are therefore disposed at the best advantage to stand the strain brought on them by a car off the track.

The steps on the Boston & Albany cars are very convenient, the bottom step being nearer the rail than usual; and the proportion of width of tread to height of rise being considerable, makes the steps easier. Four steps are provided, exclusive of the platform, so that the rise between each tread is not excessive. This little point makes a considerable difference in the comfort of the passengers, and as they can alight in considerably less time, the train is not detained so long at stations, which is an important point in working suburban traffic. The time at stations is further reduced by another small detail. The smoking cars are distinguished by an inscription on the steps which is calculated to catch the eye of a passenger, before entering the car from the station platform. This seems a very convenient method of distinguishing a smoking car, as when the inscription is on the letter board, a passenger has to walk *past* the steps before the inscription can be seen.

The railroads around Boston are, as is very generally known, largely patronized by ladies, who form apparently a very formidable proportion of the total number of passengers. Both the above improvements seem designed for their especial benefit, the legend "smoking car" serving as a beacon of warning to one sex as much as a haven of rest to the other.

The Old Colony Railroad have also been following the same improvements, but while the method of distinguishing the smoking car has much to recommend it during daylight, the inscription on the steps is practically illegible after nightfall, unless the car happens to stop at the platform just opposite a station lamp. Should the latter be opposite the centre of the car, the body throws a deep shadow on the steps, and it becomes necessary to distinguish the smoking cars by a temporary label hung outside.

The adoption of some of the various methods of lighting the steps would be an additional convenience, and would also save time at stations.

The passenger cars are very quietly and plainly finished, with no fancy carving, or moldings or gold leaf either inside or out. The body is painted a yellow brown, which looks darker rather than dirtier after use. The color is well set off by a moderate amount of plain black and gold striping. The lettering on the body of all cars is confined to the words "Boston & Albany" on the letter-board, the smoking cars being in addition lettered on the steps as before described.

The iron machine shop is small, but conveniently arranged. The steel-tired car wheels are turned in a machine specially designed for the purpose by Mr. Fred. H. Miles, of Philadelphia.* This lathe was running somewhat slowly at the time of our visit, but was turning out very good work, the cut having a smooth surface, without chatter, and the lathe running steadily and without vibration. A practice which deserves to be imitated has just been commenced at their works in turning steel-tired wheels. Chips of each tire turned are collected and put into a small glass bottle, which is labeled with a record of the mileage made by the tire, and any remarks as to the tire proving hard or soft, the name of the maker, the kind of wheel, the nature of the service, etc. When a sufficient number of samples have been collected, it is intended to have an analysis made with a view of ascertaining what influence the chemical constituents of the steel have on the wearing qualities. The information thus gained is likely to be very valuable if carefully analyzed, and proper allowances made for all disturbing influences, such as undue flange wear produced by bad workmanship in making the truck or pressing the wheels on the axles. Under these circumstances, a good tire may give a very short mileage, while if the wheels are at liberty to run exactly square, and the wear is properly distributed between the two wheels, an inferior tire may give a very fair mileage.

The blacksmith shop is conveniently arranged, with the fires at the sides of the shop, and the tools, hammers, etc., down the centre. It is provided with two steam hammers and one drop hammer. The latter is used in conjunction with formers for making truck arch, bars, etc. The tin shop, trimming shop, etc., are like all the other shops, neat, clean and well arranged, but call for no special remark.

The Ames coupler is being fitted on the freight equipment, and a large number of these couplers are to be seen in different parts of the shops, being fitted up for service.

The New England Railroad Club on Car Seats.

The regular meeting of the New England Railroad Club was held at the rooms in the Boston & Albany passenger depot at Boston, Dec. 9. Mr. J. N. Lauder occupied the chair, and after the report of the committees appointed at the last meeting had been made, announced the following as the subjects for discussion during the evening: First, Car Seats. Second, The Combination of Springs best adapted to Cars and Locomotives; and which is the best Spring for Freight Cars, Spiral or Elliptical?

CAR SEATS.

Mr. M. N. FORNEY read an elaborate paper upon Car Seats, illustrated by blackboard drawings, and by a full-size model of a seat invented by himself—which he claimed was specially adapted to the human form, the seat itself being broad, slightly concave, elastic, and slightly elevated at the front edge; the back of the seat inclining backward, projecting at the lower part, to accommodate the small of the back, and also at the top to accommodate the head, and when turned over and reversed, presenting the same features. This paper will be published in full at some future time, with suitable illustrations.

Mr. F. D. ADAMS (Boston & Albany): Mr. Forney has produced a very comfortable seat. I examined some seats the other day on an entirely different plan, the whole seat having a rotary movement, and revolving, instead of the backs turning over. They can be upholstered so as to fit the shape of a man very comfortably, and are less open to objection than any seat with a reversing back. I approve of Mr. Forney's suggestion to place his seat in a drawing-room car, and let the public judge of its comfort and convenience, and determine whether they prefer his double seat to an ordinary parlor car single chair. We are apt to follow in the footsteps of our predecessors, and therefore have adhered so long to the ordinary chair. I think Messrs. Pottier & Stymus did a great service to the public when they produced an improved chair. We have ten cars fitted with chairs in that style. The form of the back is a very great improvement over the ordinary car seat. The tipping of the seat is not new, but is a great advantage in preventing one from slipping off. It is uncomfortable and tiresome to sit on an entirely flat seat; and if it is convex we slide off, and if considerably rounded it is very difficult to sit on. But it requires a good deal of decision to induce an upholsterer to make a concave seat; he imagines that he cannot make it so handsome, and so he opposes it, and it is a difficult matter to get him to upholster a seat as it ought to be.

Mr. W. W. SNOW: In long days of travel I have two or three times got into a car with rattan seats, somewhat concave in form, with no upholstery at all, and I have been less tired at the end of a day's journey than if I had sat on any other seat; and for long rides, a rattan seat made in the form of the one described by Mr. Forney would be the best.

Mr. H. A. LITTLE: The new Broadway street cars in New York give an opportunity of testing the merits of concave and the convex seats. The Stephenson cars have the concave seat and the new Pullmans have the rounding seat, and I always pick out the Stephenson cars to ride in.

Mr. COLEMAN: My earliest recollection of a seat is the old Sunday school bench, with a flat seat and flat back, perhaps a little inclined, and we know the effect of putting in a book behind to fit the form. Americans tip the chair back, in order to assume the position which is most comfortable. Comfort is produced by getting a proper angle between the seat and the back.

The good sense of the paper which has been read to-night, especially with regard to the adaptation of the seat to the form of the body, is apparent to everybody. A man could ride a thousand miles in the seat presented by Mr. Forney with less fatigue than he would experience in riding a hundred in an ordinary car seat. There is nothing more uncomfortable than the average car seat. I have noticed in the English, French, and especially the German cars, there is a great deal of attention paid to this very idea of having the seat conform to the body, and for this reason there are no more comfortable cars than those of Germany and Russia. The fatigue in sitting is due largely to the angle at which the body is placed. The form and angle of this seat completely fill the bill.

Where there is any jolting of the car, the seat should be covered with some material that affords a certain amount of friction. On the Italian roads the seats are covered with a material made of silk and linen, exceedingly neat and clean-looking: it wears well and appears exactly the right thing at first glance, but it is slippery and hard, and ladies who sit on these seats, and wear silk dresses, find at the end of their journey that their dresses have been ruined, because the silk has acquired a polish from the seat which cannot be removed. Therefore, something of the nature of plush is needed for the covering of the seat, to afford a certain hold, and prevent slipping.

Mr. JOHN COGHLAN (Boston, Revere Beach & Lynn): The angle at which a person sits makes a great difference as to the ease of sitting. I am glad that Mr. Forney has succeeded in introducing into his seat the idea of making it conform to the body; and as to the proper angle for the seat I don't remember that I have seen anything easier than the seat before us. The single objection that occurs to me in introducing it would be that in a double seat of this kind the occupants would not be so independent as if they were separated in single chairs. On the other hand, one person occupying it alone would be able to throw his legs on to it, and curling his feet around, could take a nice nap. It would be an excellent seat for long riding. The expense would be somewhat great, but not more than some of our seats in use at present.

Mr. COLEMAN: In the present seats men only have been considered, and the average car-seat is too high for ladies. When sitting their toes barely touch the floor, and if the car seat were lowered a little from the standard, their comfort as a general thing would be enhanced.

Mr. FORNEY: In regard to the drawing room cars, the idea I have had in my mind was—though it has been resisted by the managers of drawing room cars—to put that seat in place of the chair. You can put as many seats of that kind into a car as you can chairs. If that seat is sold at the same price as a chair, a person can have the exclusive use by buying the whole seat, or if he desires to take his wife or friend or some other person in with him, he can do so.

Mr. ADAMS: Too high a seat is a material objection, as Mr. Coleman says. Some years ago we concluded that the seats were too high, and we dropped them 2 in. Some tall people thought they were too low; but they have been used ever since, and we have made all our seats of this height—2 in. lower than formerly. Occasionally they are called too high. Every seat is about 16 in. to the top of the cushion. If a seat is too high, the pressure upon the arteries of the under side of the leg will cause discomfort.

Mr. COLEMAN: If the seat is much inclined, it should be soft and spongy on the front edge, for if that part bears unpleasantly on the under side of the leg, it stops the circulation, and produces cramp.

Mr. LAUDER: The rotary seat of Mr. George Buntin, which has been referred to by Mr. Adams, has advantages aside from what appears on the surface. The seat can be upholstered in any way you like. You can have any form of seat you like, because it has a rigid tilt, and you can tilt it as much as you please. It will admit of the easy cleaning of the car. It is difficult to clean under the ordinary car seat, where there are footrests, and sometimes steam-pipes, and therefore it is usually very dirty under the seat. But the rotary seat can be swung round against the window, and then swung the other way, leaving nothing except the round centre pedestal to obstruct the free circulation of the broom and mop, if the steam pipes are run on the side, as in parlor cars. I don't like the seat on exhibition at Williams & Page's; the back is too straight, and the seat is tilted too much; but that does not affect the principle of revolving the whole seat instead of reversing the back. It will be a good seat when properly worked up, and give the results that Mr. Forney aims at in his seat. It may possibly take the place of chairs in the parlor cars, the whole seat being sold, as Mr. Forney suggests, in place of a chair.

Mr. ADAMS: In the revolving Buntin seat referred to by the Chairman, the back is concave longitudinally as well as concave vertically; the end of the seat is comparatively

* This machine was illustrated and described in the *Railroad Gazette* of June 19, 1885.

round, and the back follows round in connection with it, and is very comfortable.

Mr. GEO. F. SMALL (Hale & Kilburne): Will the seat devised by Mr. Forney fit equally well persons of different proportions? It is perhaps impossible to adapt the back to fit every one; but it is desirable, if possible, to have it adjustable so as to fit either a lady or gentleman at any time, in the small of the back. I have had some experience in upholstering, and a seat of this kind, which may fit the small of a gentleman's back, and be very comfortable to him, might be very objectionable to a lady, who does not dress like a gentleman, and is a good deal expanded in that region, but in the old style of car seat she has got room for her bustle.

If the seat is concave and rigid in front, while you are sitting straight, you will find it very comfortable for a little while, but if you turn on one side you have then not as comfortable a seat as the old convex seat, simply because, if the latter is properly upholstered, with proper springs underneath, the person sitting on it will make his own impression in it, and it will conform to his body. I have tried the concave seat in every way with springs of different kinds, and finally I was instructed by Mr. Adams to make the seats as we formerly made them, and have done so since. I exhibited at the Chicago Exposition, two years ago last June, a seat intended for a parlor car, which was similar to Mr. Forney's, only it had not the concave back but had a concave seat, and also a pillar at each end. It was found to be impracticable on account of the cost, being more expensive than the old style of seat or the chair. For the regular passenger car, the only true and proper form of seat is the convex, properly upholstered, a seat that will give to the person when he sits in it, and covered with plush or some similar cloth that will cling to the person; the seat to be tilted in some way, no matter by whose patent it is done, so as to be slightly elevated in front, and to conform to the person. In that way you arrive at the proper method of sitting without the bearing under the knee. I think I can safely say that there is no other spring in the market at the present time that is so well adapted to use in car seats as the Hale & Kilbourne spring, requiring less material for upholstering than any other I know of, and a spring that will maintain itself longer than any other in the market.

Mr. COLEMAN: I don't agree with the last speaker in regard to swinging round in the seat where it is curved, especially as regards the European cars, where you can sit either straight or swing round with entire comfort. We should take the best things wherever we find them, whether abroad or not. I averaged a hundred miles a day of railroad travel for six years in this country, and was ten years on the other side, and traveled from one end of Europe to the other, and into Egypt, enormous journeys, and I was struck with the far greater comfort of the seats in the European cars over ours, and I don't think the objections the gentleman has made are valid in practice. And as to the argument about the ladies, if they choose to dress in a ridiculous manner and build on something behind that don't belong to them, they must suffer the consequences, and this is a point that need not be considered by the car-builder.

We are obliged to postpone the publication of the discussion on car springs.

Henry's Tilting Cushion Car Seat.

The accompanying illustrations represent a form of seat in which the seat cushion is automatically inclined when the back is reversed. This form of seat has been only recently introduced, but is already largely used on the Boston & Maine (Eastern and Western Divisions), the Boston & Albany, the Long Island and other railroads.

The tilting attachment is so constructed that in reversing the back the cushion is tilted without the back coming in contact with the seat. The wear and friction caused by the seat and the back rubbing against one another are thus avoided, and at the same time the seat is held securely, and has no tendency to slide forward, to the manifest discomfort of the passenger.

Fig. 1 is a perspective view of the wall end of a seat frame in position in a car, the rocker beam support or cushion support tilted and locked.

Figs. 2 and 3 show the entire attachment, consisting of a malleable iron striker arm *A*, two hanger or suspension arms *B* and a rocker beam *C*. Two of these attachments are of course required for a complete seat. The attachment is shown ready to be placed in position on seat frame, the hanger arms at their curved ends being riveted to the slotted end of striker arm and their opposite ends bolted to either end of rocker beam.

The striker arm *A* is fitted to the stud *D*, the rocker beam *C* at its slotted centre resting on stud *E*, these two parts being connected and fastened together by hanger arms *B*. The points where the hanger arms *B* are pivoted to the striker arms *A* are so located, that when the back is in proper position, force or weight applied to the cushion will only tend to hold striker arms *A* with increased force against the lugs *F*. In this position, the cushion is firmly locked so that there is no rattle or play of the parts. The cushion can only be released by raising the back. The inventor claims that with this attachment the striker arms are not likely to be broken, as in reversing, the back falls with considerably less force than in the usual arrangement.

As shown, the arrangement is attached to Buntin's seat frame, but it can also be used with a seat frame with wooden arms. The frames may be ordered of Geo. Buntin & Co., of Philadelphia, or of the patentee, Mr. F. H. Henry, Wakefield, Mass. Frames on this principle, fitted with rattan cushions and backs, were exhibited by the Wakefield Rattan Co. at the recent Master Mechanics' and Master Car-Builders' conventions. This company have the exclusive right to this frame when used in connection with rattan or cane webbing.

Best Material for Journal Bearings.

The closing portion of the meeting of the Western Railway Club, reported in a recent issue, was devoted to the discussion of this subject.

The following letter from Mr. J. N. Barr, Mechanical Engineer of the Chicago, Milwaukee & St. Paul Railway, was read:

"We have made some tests of bearings: weighing bearings and calipering axles carefully. The results of our test have been in general as follows:

"1st. Very soft bearings lose nearly 40 per cent. less in weight than hard brass or bronze per 1,000 miles run.

"2d. The journals under soft bearings decrease in diameter nearly twice as fast as those under hard bearings.

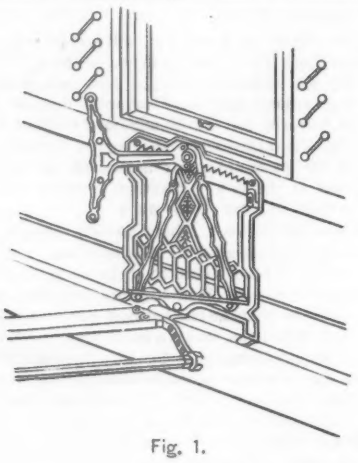


Fig. 1.

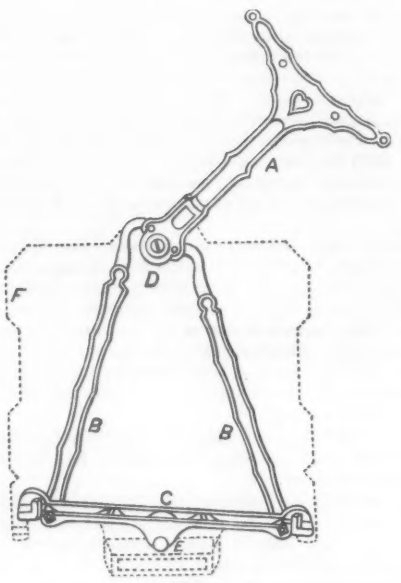


Fig. 2.

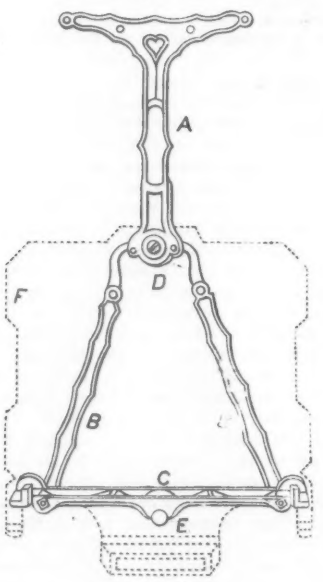


Fig. 3.

Henry's Tilting Cushion Car Seat.

"The experiments from which the above results are obtained were carefully made, but are possibly not sufficient to establish the principles advanced as facts.

"The question as to which is the best material for bearings depends upon a good many points, of which the following are chief:

"First, the cost. The results of our experiments make it extremely doubtful as to whether the softer, cheaper and slower wearing soft bearing is in the end cheaper than the hard bearing.

"Second, the tendency to heat is a very important matter, and in this respect I presume there is no question but that in all points on the road where bearings are changed without proper facilities for fitting them to the journal the hard bearings are more liable to run hot.

"As to the amount of oil consumed by the different bearings, I have no data and think that it does not play a very important part. As a result of my observations I am decidedly of the opinion that in shops where bearings can be properly fitted to journal a hard bronze is best, and at car-repair points along the line a soft filled or lined bearing gives the best results."

Mr. MCDEVITT (Chicago West Division Railroad): I have been using soft bearings for 12 years with good results. We buy no brass bearings. I have my bearings cast in shells, and line them with anti-friction diamond metal, using the same shell over and over.

Mr. COOKE (Chicago & Eastern Illinois): For our freight cars that go all over the country we use solid brass, mixed about 7 to 1. We can get along well enough with shells filled with soft metal in passenger cars which stay at home, but we would be afraid to start off freight cars to go all over the country with soft metal in a shell.

Mr. MCDEVITT mentioned that he used scrap brass cast into shells; not iron. It takes less oil and runs easier.

Mr. VERBRYCK (Chicago, Rock Island & Pacific) was still doubtful, but his experience has been entirely opposite to that of Mr. Barr's in regard to the wearing down of journals of soft metals. Some years ago he made some careful experiments on the passenger service. After running some bearings (Fitz) for a year, brass on one side and soft metal on the other, he found that the soft bearings not only made a very much larger mileage, but the brass wore the journals down much more than the soft metal did. Thereafter he adopted soft metal, and had extraordinary results from it. The bearings in passenger service averaged a little over 158,000 miles, and wore the journals very little. Brasses were carried in the cabooses for use in case of accident, but they used principally the Fitz metal. Since a change of ownership, two years ago, the metal had not been the same, and they could not use it in freight service. It cost about 7c. to 9c. a pound. It was composed of lead and antimony.

Mr. COOKE: Our experience in regard to soft metal is different from Mr. Verbryck's. On our locomotives soft metal always wears the wrist-pin faster than the brass.

Mr. PULLMAN: During the time Mr. Verbryck speaks of, probably four or five years, we ran very successfully with Mr. Fitz's filling. During that time all the wheels that were taken out had the journals smoother, nicer, running parallel and in better shape in every respect, than with any brass or any other filling that we tried.

Secretary FORSYTH (Chicago, Burlington & Quincy): I know that Mr. Barr has made a great many experiments, and very careful ones, on bearings. He has probably experimented with them more than any other man in the country, and I should rather hesitate to disagree with him, but I am inclined to think that in this case his experiments have been made with poor boxes and he has let in a lot of dust and grit which has made a lap with the soft bearings and worn his axles more rapidly than the bearings. The subject is important, and I think that if experiments are made with good boxes different results will be obtained. The filling is so cheap that that is certainly a recommendation. Antimony and lead can be bought for about 5 cents a pound, and the hardness of the lead can be easily regulated by the amount of antimony in it. This is a product of some of the lead refineries, and it can be bought in large quantities with any per cent. of antimony that you want. I am inclined to think that the best and most economical bearing is a shell filled with antimony and lead mixed in proper proportions.

Mr. VERBRYCK: While we were making our tests we were careful not only to caliper our journals, but to weigh our soft bearings against the brass, and we found a very great difference in the cost.

A former subject for discussion was continued to next meeting, and amended to read: "Best Material and Form for Smoke-stack and Netting, and the Construction of Front Ends of Locomotives."

The following subjects were also appointed for discussion at the December meeting: "Specifications for and Inspection of Contract Cars," "Fire Protection for Railroad Property."

Sellers Double Axle Lathe.

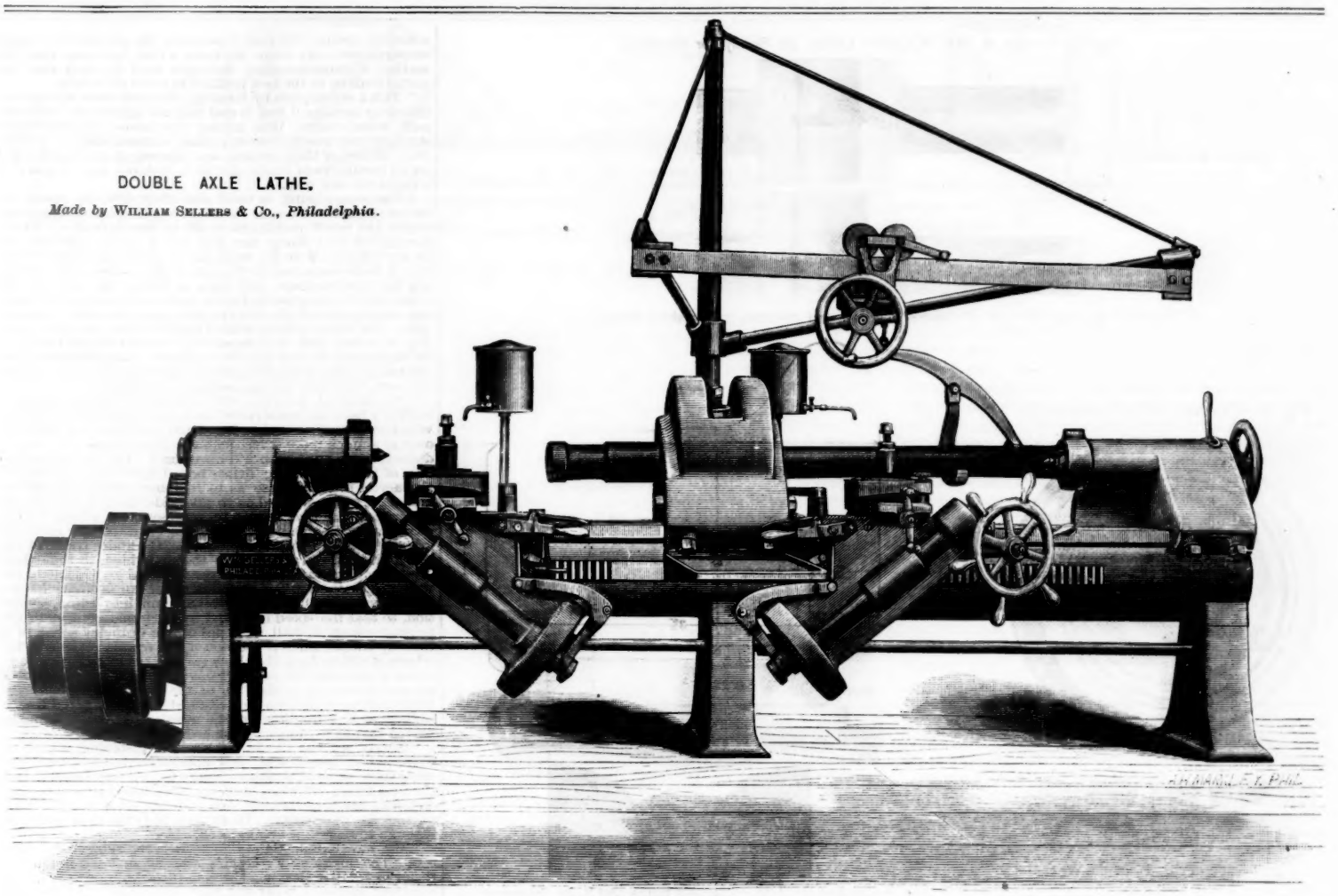
We illustrate in this issue a double-headed axle lathe, designed and manufactured by Messrs. William Sellers & Co., of Philadelphia, who inform us that during the year 1851 they sold the first lot of double axle-lathes made by them. These lathes embodied many of the important features of the tool they now build, but differed in details of construction. For instance, they arranged the central driving head with a Clements driver carried on universal joints, so as to vibrate in any direction needed to accommodate itself to the inequalities of the rough axle, and to compel rotation without strain on the axle, other than torsion, and provided independent power feeds to each of the two slide rests.

Examples of the Sellers lathe of 1851 are still in use, but as constructed it failed to meet their expectations, so far as quantity of work was concerned; and it was found that their single axle-lathe when improved to its present efficiency, though turning only one end at a time, was capable of doing as much work as the old double machine. During the 34 years intervening between the design of these lathes and the present time they have turned their attention to perfecting the single lathe, adapting it to the requirements of the increased size of axles and to the turning of steel in the place of wrought iron. In perfecting the single lathe they claim to have so arranged the parts as to reduce to the minimum the time of handling the lathe and the time required to adjust the axle, apart from its actual work in cutting, demonstrating the great advantage of saving time between cuts in increasing the out-put of the tool. In the light of the present state of the art of axle turning, Wm. Sellers & Co. have now designed an axle-lathe to turn both ends of the axle at the same time, in which tool they introduce the features prominent in their lathe of 1851, but under the more favorable circumstances of having a larger and stiffer axle to work on than was the case in 1851, and in the introduction of improved methods of turning, combined with special contrivances to enable them to put the work in and out with greater dispatch. Thus, while they use a driver in principle the same as that built by them in 1851, yet from having a new and better manner of placing the axle, they can make the opening in the spindle smaller for a larger axle, and obtain bearings not too large in diameter and of equal length on each side of the driver. They place the axle between the centres before the driver is attached, and then tighten up the driver through a gap in the middle of the driving head; thus taking hold of the centre of the axle in the middle of the driving-spindle, and the power to turn the spindle is also applied directly in the middle of the driving-spindle, thus insuring a condition of absolute stability under rotation.

They introduce all the devices found so effective in the dead-heads in the slide-rests, and in the feed motion of their regular axle-lathe, adding to this machine a crane that does away with all objection that can be urged against the double lathe, on the score of time lost in setting the axle. To a post behind the lathe, but attached to it near to the centre of the length of the bed, is swung a horizontal jib carrying the hand hoisting gear. This jib is suspended at some distance from the side of the vertical post so that it will swing around it, and when directly over the lathe bed will be in line with and

DOUBLE AXLE LATHE.

Made by WILLIAM SELLERS & Co., *Philadelphia*.



directly over the axis of the lathe. When it is at such an angle as will permit the swinging axle to pass the fixed poppet-head, the axle can then be thrust through the spindle until its centre coincides with the centre of the driving spindle, and the axle is thus placed in centres without any other movement of the swinging jib. The centre is reached, as stated above, by means of a peculiar hook combined with a strut that is as readily applied as a single hook, and while it catches the axle out of centre far enough to clear the head, yet by means of an arm it carries the centre of the axle directly under the centre of the hoisting carriage. Axles placed behind the lathe bed and parallel with it can be taken by this crane, lifted to the right height very quickly, swung into place from the end to pass through the live head spindle, and then brought into line of the centres; the axle taking its place as readily as if there was no driving machinery in the middle of the bed to complicate the problem of setting.

This improved method of getting the axle into the machine makes a vital difference between the tool and all others that have preceded it. This new lathe is capable of taking as heavy a cut on both ends of an axle at the same time as their single lathe will take on one end. In other words, it has twice the driving power. The feeds are the same, and all the devices found so useful in the adjustment of the tool and in the quick operation of all the hand movements are the same on this lathe as on their single lathe.

The double lathe takes up less space than two single lathes, and, as arranged for getting the work in, should yield better results in time than two single lathes run by the same workman, as the time of turning the same axle end for end is saved.

An independent stop motion is provided to each of the slide-rests, so that if from neglect they are permitted to feed up to the centre head, the power feed will be thrown out, thus preventing damage. A tool shelf is placed near to the driving head, where it is convenient for the workman to place his gauges and extra tools.

Heating, Lighting and Ventilating Passenger Cars.

The last meeting of the Master Car-Builders' Club, in New York, was devoted to a discussion of this subject.

Mr. W. C. BAKER opened the discussion, referring to the difficulties of car ventilation. There was no human habitation where so many people constantly congregated within so limited a space. The contents of an empty, average sized car is about 3,500 cu. ft., or about 3,000 cu. ft. net. A pair of lungs consume 7 cubic feet of pure air a minute, hence an entire car full of air is destroyed every 10 minutes. The sudden changes of conditions added much to the difficulties. Contrast this portable house on wheels with an ordinary room, say 15 × 20 × 10, which equals in volume a car.

The great difficulty is to practically warm the car at every point, and the one point where heat is wanted is in the stratum of air near the car floor. To keep the heat down there permanently, and at the same time keep the heat away from where it is not wanted—that is, around the heads of the passengers, where the air should be cool and fresh—these are the great desiderata. Physicians state that the atmosphere of most of our cars is a prolific cause of disease.

In answer to questions, Mr. Baker said:

A coil surrounded by fire is found superior for generating or diffusing heat to any other device in economy, but the great point is that of safety. It is well known that boilers do burst. They are liable to burst from the freezing of the water in them. Of course, where salt water is employed, as it is in some cases, the danger is reduced. It is not practicable to heat cars by hot air alone. It has never been done successfully. There have been attempts by using a couple of hot air furnaces. The fresh air was supplied from the outside by an arrangement that worked fairly well when the car was in motion and the wind favorable, but not till then would the air come up through the little holes that opened in the flue along the base. The flue would soon get full of soot and thus become unsatisfactory. The current of air depended upon the motion of the car.

The idea of the Baker heater is simply to hold the heat where it is wanted. A system of pipes around the car radiate the heat from below. The consumption of fuel is less than that of some other systems of heating.

Mr. W. G. CREAMER: The question is how to ventilate with the least expense and in the most simple manner. All the devices that I have ever seen for heating cars, provided for the taking of the air in on the top of the car. My theory is to take the sash and blinds out of the window behind the stove, and in the opening insert an injector. This is hinged and projects about 3 in. from the side of the car with its mouth toward the engine. Attached to the injector is a wire netting intended to catch all particles that may be in the air. The air is driven in through this netting into the car, around the stove, and then distributed about the car. When the cars are running in the opposite direction this injector is pulled against the car into place and the one on the end of the car toward the direction the train is moving is opened by the brakeman and works as described. We had four cars equipped with this arrangement running on the Fitchburg road, and they work successfully.

Mr. BAKER: Would the air be properly warmed if the car was going a mile a minute and the wind blew 30 or 50 miles and hour against it?

Mr. CREAMER: There is practically no difficulty of this kind; but I do not think we often find such conditions. The stove is so constructed that the heat is thrown out into the car. When the car is standing still the ventilation is the same as that of a room. This system is also aided by my system of exhaust ventilation, by ventilators placed in the top of the car.

Mr. BAKER: One feature of that system has proven a failure. It depends on adjusting the injector every time the car reverses its motion. This has been tried on roads and found unsatisfactory, the adjustment being forgotten.

Mr. CREAMER: I don't imagine there will be any serious difficulty of that kind. I can arrange this injector so that it will be automatic, and when the direction of the cars change it will change itself. The handles that operate it are close to the stove. I make the combustion chamber of sheet iron instead of cast, and line it with fire brick, and from the bottom of the grate about 4½ in. up there is a cast-iron pot. I calculate that a set of brick will last for two or three seasons and can be replaced for 75 cts., through the door of the stove. The ash pit is large so that the construction of the stove is, I think, about as perfect as it can be. I employ one stove in each end of the car. The heater could be made large enough so that one would answer, but two are better.

Mr. BAKER: How do you hold the heat on the floor of the car?

Mr. CREAMER: It cannot be done. Hot air will rise, and when the car is standing still the effect is just the same as in any other stove. When the car is in motion the warm air comes out under the seats all over the car.

Mr. BAKER: My new form of heater is now in practical use on 90 cars on the Brooklyn elevated road. The stove stands in one corner of the car enclosed in a cabinet. Under the stove in the center is a 12 in. hole through the floor, opening under the car. When the car is not in motion the natural current of the air comes in, travels nearly the whole length of the car, and when it is in motion the current is somewhat accelerated, though not materially. It is a fact that an aperture made in the floor of a car, opening underneath, is not affected especially by the currents either way. Cinders from the track are not present when the heating apparatus is in use. The track is usually frozen. When the heater is not in use the hole is covered up. It is self-controlling to a certain extent. When there is no fire in the stove there is no tendency for the air coming through the whole. As the heat is increased the air is drawn in. The new form saves about one-third of the fuel formerly burned.

Mr. OWENS: Mr. President, I fully agree with Mr. Baker in the hot water system. I represent the Smith & Owens heater of Detroit. We have a device for heating and a circulation of hot water, largely the same as Mr. Baker's, but he obtains his heat entirely from the coil. We think the coil necessary; but in addition have a boiler. The boiler stands 29 in. high, 13⅛ in. at the top inside, 15⅛ in. at the bottom inside, 17 in. at the top outside and 19½ at the bottom outside. It is made of ¼ in. steel. Each one of our boilers, before the coil is put in, is tested to 180 lbs. cold water pressure. We have a water space of 1½ in. at the bottom and 1¼ in. at the top. Half way up the boiler we connect the shell with the coil from the outside. Water circulates from the coil into the chamber. The outside of our boiler we encase with Russia iron with a 2 in. air space. When you have the biggest fire you can clasp the boiler with your arms, and you can detect no more heat than you could by putting your hands on a board. It does not require the car to be lined with iron, nor does it crack the wood work. We furnish the same amount of heat at the further end as at the heater. With a heater employing simply a coil it is impossible to circulate the water as effectually as where the water is heated in a boiler and then passing from the boiler, hot, into a coil and then through the cars. By actual test our system has been found to show a saving of over 40 per cent. in fuel.

Mr. BAKER: Your boiler is riveted. Suppose the water should get all out of the boiler and you had a smart fire going; is there anything to prevent the boiler burning out?

Mr. OWENS: We place with the boiler a water gauge, and have a patented device for injecting into the boiler any time, against 300 lbs. pressure, any amount of water. The water is encased in a box containing 10 qts. In that is a device for injecting the water without stopping the train, climbing on the roof, or anything of the description. In case of a wreck there is a connection which will break at the back of the heater and we have enough water in the boiler and coil to put out the fire.

Mr. WILLIAM MARTIN (of Dunkirk, N. Y.): I represent a system of heating which is now in practical use on the Cleveland, Columbus, Cincinnati & Indianapolis road. It is simply a main pipe running under the train its entire length, connecting with the locomotive. At about the middle of each car this main is tapped, the connections running to each side of the car, up through the floor and extending from one end of the car to the other. These pipes return to the starting point, descend and meet underneath the car in a trap through which the water of condensation is discharged. A valve is placed in the car so that the heat may be shut off or turned on at will. The steam is run from the locomotive at low pressure. The main pipe is joined by metallic couplings consisting of a peculiar ball joint. A valve is also placed under the end of each car to shut it off from the rest of the train. The theory we maintain is this: In order to have good ventilation you must have a superabundance of heating power for the coldest weather. You cannot advantageously use that heating power except you have control of it. Therefore, if you have a superabundance of heat and have a mild day, the people will sweat and grumble. It is estimated that on the C., C., C. & I. road it is possible to keep up this system which I represent, with wear and tear, for 50 cents a month. There seem to be some drawbacks to all systems, and ours is this: We must have an engine to warm the train, but we have a stove in the car in case it ever becomes necessary, from long side tracking or absence of the engines to keep the car warm

LIGHTING CARS.

Mr. CREAMER: I light by oil lamps. The frame work of the lamp comes down to the bell-rope and then the font branches off on each side and comes down about 7 or 8 inches lower, so that the bottom of the font of the lamp is about 6 ft. 4 in. from the floor. Each double font is entirely independent of each other, and they are interchangeable one with the other. My theory of the lamp is that the common sense of lighting a car is to light it so that it will accommodate the

Fig 1.—Section of Part of Centre Coiled Up Ready for Welding.

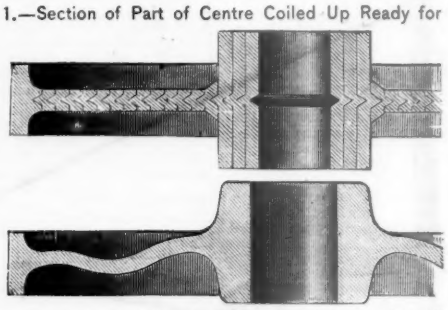


Fig. 2.—Section of Part of Centre Welded and Pressed to Finished Shape.

Fig 3.—Elevation of Finished Wheel.

Fig. 4—Section of Finished Wheel.

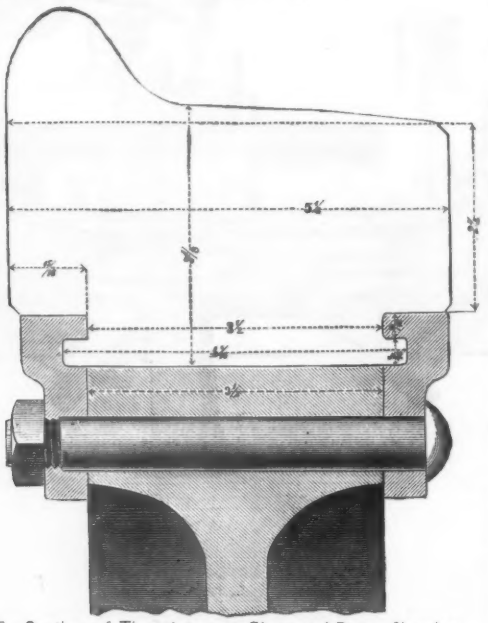


Fig. 5—Section of Tire, Retaining Rings and Bolts, Showing Tire Shrunk on Wheel-Centre and Secured by Retaining Rings.

Wrought-Iron Coil Disc Centre with Retaining Rings.

Fig. 6 —Elevation.

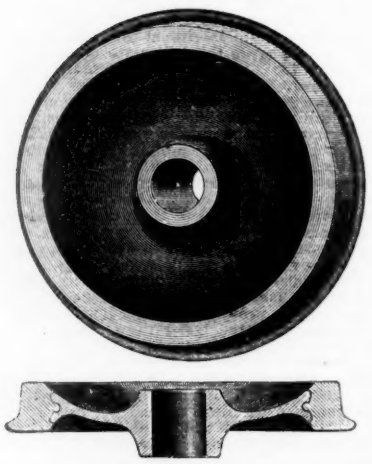


Fig. 7.—Section.

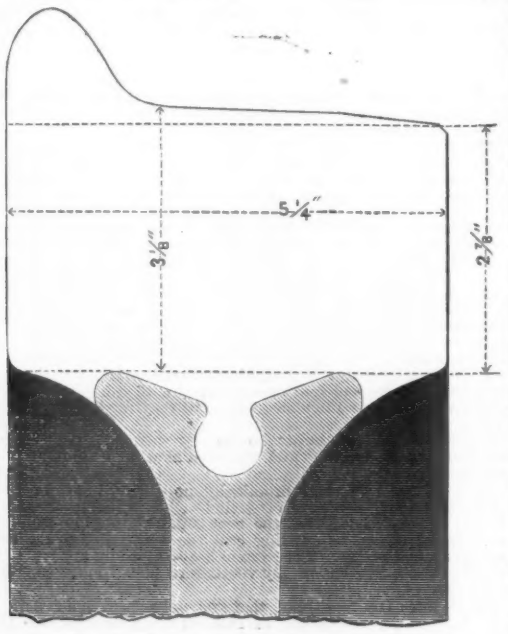


Fig. 8.—Section of Tire showing Safety-Lock Connection with Centre.

Wrought-Iron Coil Disc Centre and Safety-Lock.

KRUPP'S STEEL-TIRED CAR WHEELS.

passengers. The lamp is intended for kerosene. I hardly know whether it will entirely prevent smell. There are ventilators over them to carry off the smoke, and I think there is a great advantage in having the lamp where it can be reached from the floor of the car. If this is the case, I think it is much more likely to be well cared for, and it is more satisfactory to the passengers. Three or four lamps are placed in a car, according to its length. Any number can be used, as may be desired.

Krupp's Steel Tired Wheels.

The accompanying illustrations show a form of steel-tired wheel which has hitherto been little known in this country, though very extensively used in Germany and to a less extent in other countries. The novel method in which the wrought-iron disk centre is constructed calls for attention, especially as we understand that the 60,000 wheels constructed on this principle have done very well.

The method of making the centre is illustrated in figs. 1 and 2. A single strip of wrought iron, with rib rolled in, and of sufficient width to form the hub, tapering narrower to form the web, and then widening out again to form the rim of the centre, is coiled up as shown in the cut. The whole is then brought to a welding heat, and pressed to finished form in solid dies by powerful machinery, thus producing a wrought iron disk centre.

Figs. 3, 4 and 5 show the tire secured to the centre by means of the well-known Mansel retaining rings. Experience has shown that this method of fastening is perfectly safe, th British Board of Trade Returns showing that no broken tire thus secured has ever left the wheel. As this tire fastening has been very extensively used in Great Britain for the last twenty years, the value of the Mansel fastening is well attested.

Mr. Krupp, however, has introduced a method of securing the tire to the centre of the wheel which dispenses with bolts and nuts and loose retaining rings. It is, however, open to the objection that the tire cannot be removed when worn out. This method is thus described by the inventor:

"In order to secure absolute safety, a wheel should have a forged steel tire and a wrought iron coil disk centre so combined, that under no conditions can the tire if broken into any number of pieces, get away from the centre, and the centre so constructed that it possesses the greatest structural strength, not only from its being a disk, but also that the method of manufacturing this disk shall be such that the metal shall be in the best position to resist all strains.

"This I accomplish by forming the disk from a long bar, coiled up (see figs. 1 and 2) and then all welded into one compact wheel-centre, thus giving enormous circumferential strength not reached by any other construction of centre. Over 60,000 of these centres are running in all climates and on all conditions of roads, and in no instance have I heard of a failure in any way.

"The centre being in itself absolutely safe, the union between the tire and centre should be so perfect that separation under the worst conditions would be impracticable. This I accomplish by welding tire and rim of centre together, not by an ordinary V or flat weld, but by giving the inside of the tire a bulb shape, and to the rim of the centre a corresponding but reverse shape, and then so fitting the one into the other that it is impossible for the bulb on the tire to be drawn out, as the sides of the tire clip the rim of the centre on each side. The whole is then welded together into one solid mass. Fig. 8 shows that it is impossible for the tire and centre to be separated, if even they were simply a mechanical fit, but the two are also welded together so perfectly, by a process of my own, that they become metallically united.

"Not satisfied, however, with this theoretical conclusion of safety, I have had constructed an apparatus which shall test wheel constructions under the actual conditions of running, only in a much more severe manner. Two wheels of 6½ ft. in diameter are keyed upon a central shaft. On the circumference of these wheels are firmly bolted steel rails, cut diagonally across their faces so as to represent joints. There are also check rails, so fixed as to give side blows to the wheels under test and also means to represent the effects of the points and crossings. The wheels to be tested are mounted in axle-boxes in a frame, representing the under frame of the car. The railway wheels are then weighted, so that their pressure on the rail shall be as nearly equal as possible to the weight upon them when running under an ordinary loaded passenger car. The wheels are then put into rapid revolution, so that the speed imparted by frictional contact to the railway wheels B shall be equal to the ordinary speed of a railway train. Each revolution of the wheels A gives to the wheels B a blow from the check rail and the joints far more in excess than under the ordinary conditions of running. There are also means for putting on to the wheels B a powerful brake action, which can be continued for any desired length of time, so that the tires on the wheels can be so strongly heated that they cannot be touched with the hand.

"Nearly all the known systems of fastening centres to tires, when tested with this apparatus have shown unmistakable signs of weakness, many giving way entirely and the tires flying off when broken. The Mansel retaining ring fastening has been the only one that has stood the test with any degree of security. In all these tests the tires were cut through to represent breakage.

"My new Patent Safety Wheels were subjected to this test. The thickness of the tire was at first 2⅝ in., and it then ran 1,216 miles, when it was turned down to ½ in., to represent excessive wear and ran 7,063 miles. The tire was then cut through in 10 places (equi-distant) and the wheels ran 780 miles, after which it was again cut through in 20 places and ran 780 miles, making a total of 9,839 miles, and during this time the brake was on for 2,272 miles. Several times, after the brakes had been on and the tires were heated to a high degree, they were cooled suddenly with ice cold water, and notwithstanding all these tests the wheels were in perfect condition as to safety for running. The wheel was then placed under a 448 lbs. monkey, the rim or edge of the tire resting on supports so as to allow the full blow coming on the weld. Twenty blows falling from a height of about 17 ft., and 5 blows falling nearly 20 ft., produced no effect upon the weld of the tire and centre. The tire was then cut through and steel wedges driven to try and separate the tire from the centre, but although the cut was widened out considerably, no effect was produced upon the weld."

Contributions.

An Alloy of Copper and Lead.

No. 2,040 North Tenth Street,
PHILADELPHIA, Dec. 8, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

SIR: We are in receipt of a number of inquiries concerning the alloying of lead with copper, and desire to say, to whom it may concern, that we are masters of the situation in this respect, and shall take pleasure in showing the composition put together or prove same by analysis. Our claim is, that we can alloy lead with copper, from 1 to 50 per cent., if desired. THE AJAX METAL CO.

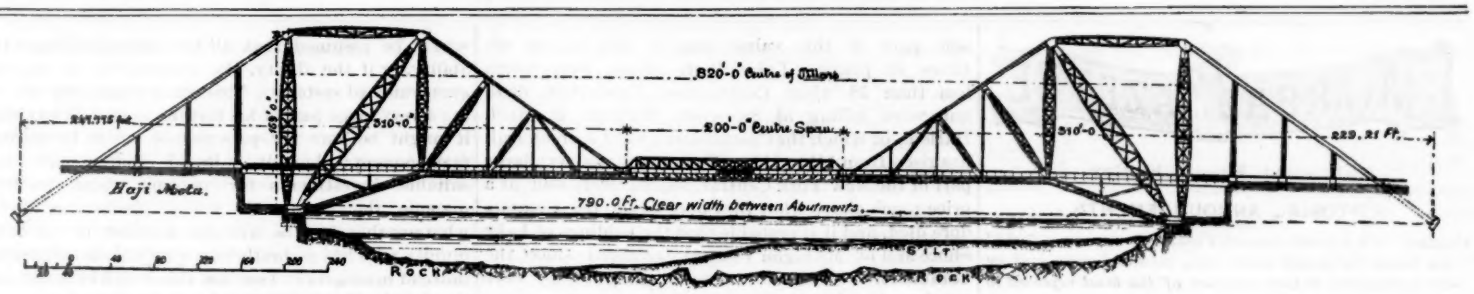
The Late Peter Donahue.

NEW YORK, Dec. 1, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The telegraph informs us of the death, at an advanced age, of Col. Peter Donahue, at San Francisco, Cal., Nov. 26, 1885. Mr. Donahue was a "forty-niner," a pioneer of California, and has aided largely in the material progress of that state. At his pioneer foundry and machine shop were made the first heavy castings and forgings for the Pacific coast of the United States. There was a sudden need of these by reason of the great numbers of steam and sail vessels which carried the thousands of able adventurers to the El Dorado. He lived to see his pioneer establishment, afterwards the "Union Foundry and Machine Company," develop into one of the largest and most improved of the present day.

While he rapidly attained wealth, he also beneficially used it, with energy, sagacity and generosity, in the development of his adopted state. He was one of the Californians who invested largely in the San Francisco & San Jose Railroad, 50 miles in length. (I believe that this was the second railroad in that state, and that it is now part of the Southern Pacific Company's system.) All through its early struggles, which were peculiarly severe, his faith did not waver. He was one of the originators, and has continued to be a principal owner, of the San Francisco Gas Light Co., and also of the Omnibus Railroad, the first horse railroad in San Francisco, I believe, in connection with his brother, of the famed Occidental Hotel. He has been an active worker on various railroads of that state, and could be relied on as such in any new enterprise for material progress that required courage, cash and endeavor. At the time of his death he was President of the San Francisco & North Pacific Railroad, of the



THE SUKKUR BRIDGE OVER THE INDUS.

Sonoma Valley Railroad and of the San Francisco Gas Light Company.

Mr. Donahue was largely a man of impulse, yet of generosity. I wish that one of his original methods of doing good in a live community were prevalent.

During the long period of years when money was worth 2 per cent. a month and upward, a favorite form of "investment" was the following: When a man had faithfully worked for several years in either department of his constantly-growing establishment, Mr. Donahue would arrange a private interview and ask, "What is your aim?" "What do you want to do in the country?" The answer would naturally be, "To have a little shop of my own in my specialty," or "A shop in which I may have an interest," or, perhaps, "To have a home." "Why not?" Mr. Donahue would ask. "I have not the capital, and am striving slowly to save it."

"How much does it require?" The man would go from the interview with the $500 or $1,000 necessary for his purpose, for which he had given his unsecured note, due at an indefinite time, at a low rate of interest.

When questioned as to the truth of this by the writer, who learned it from men thus aided, Mr. Donahue answered, "Yes, this has been the most satisfactory mode of investment made by me, and, moreover, I consider it the safest; for *I have never lost a dollar in that way*."

Mr. Donahue well filled his chosen position in the material advancement of his state, and will be mourned by his city and state, as also by the many individuals who enjoyed his characteristic generosity. ROBERT L. HARRIS.

The Mysteries of Track Inspection.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I used to fancy, when examining a stretch of track, that I saw all there is in it when I saw rails, ties and ballast. Any trackman who has spent years in mastering his business knows better than this; but it took me some time to realize my ignorance. I may as well confess at the outset that I am a novice in the science of track, yet the subject interests me greatly. Consequently, a recent invitation to attend an annual track inspection was hailed as a means of increasing my knowledge in this all-important department of the railway service.

For two days we saw nothing, talked of nothing but TRACK. I listened attentively, absorbing all I could. Oscillating around the curves, bowling along the straight reaches, jogging up the gentle grades, officials, supervisors and section-foremen kept a constant outlook ahead. Every feature of the track was commented upon; every slope, embankment or ditch came in for a share of criticism, favorable or otherwise. Stupid must have been the man who could not learn something of track, with so much said about it. Toward the end of the second day I began to fancy I had mastered the science. Approaching a section-foreman, I said, in my most winning tones:

"How smooth the track is! The oscillation is scarcely perceptible."

"The what?" he asked.

"The oscillation."

"There's none in the track," said he, resuming his critical examination of the line ahead.

I next approached an official.

"How picturesque that curve along the hillside is, with the green pines above it," I observed.

"Picturesque? Yes, —— picturesque!" he replied. "That hill pours more truck down on our right of way than half-a-dozen ballast trains could take care of. What do you think of our track?"

"Perfect! This is the smoothest section."

"Smoothest section? Why, my dear sir, this is the infernalest piece of track on the road. Even Mike Mulcahey says so, and it's his section!"

I relapsed into silence. Cognizant of my dense ignorance, I felt humbled. Mike Mulcahey, doubtless, could not write his name; but his red-haired pate was so chock-full of a knowledge of track and its mysteries that I envied him from the bottom of my heart.

"Dan," said an official to a section foreman, "I wanted to see the ditch back of that siding, but here you've got a train of empties in the way."

"Bedad," replied Dan, with amazing candor, "we run the cars in so you couldn't see the ditch! We hadn't toime to clane it out for inspiction."

In an unguarded moment I heard an official make a horrifying statement. He made it without a trace of emotion or compunction. Not a sympathetic tear dimmed his eye as he remarked: "I am running with a very small track force this fall. On some sections I have only eight-tenths of a man to a mile."

Think of the awful significance of this utterance, so carelessly, even flippantly, dropped. Eight-tenths of a man to a mile of road! For the first time the awful truth dawned upon me. Here is where the grinding monopolists place the men their trains ruthlessly cut in two. This is the use they make of shattered humanity. Is it any wonder that communism is growing? Is it any wonder that down-trodden railroad men strike for their rights? With an intense desire to see one of the eight-tenths men, I kept my eye glued on the track ahead. I saw a large number of fully developed Hibernians from time to time, pounding ballast with an energy that has passed into a proverb; but I must confess that I saw no eight-tenths men. It is highly probable that the crafty and soulless corporations keep these monstrosities on duty only at night, in order to conceal the dreadful fact from the world.

It would seem that it takes considerable money to keep a railway track in order, even when much of the work is done by cheap eight-tenths men. Although built of the best material—steel rails, white-oak ties, rock ballast—a road soon begins to retrograde. Here is where the value of a good section-foreman becomes apparent. Here his knowledge of track maintenance is tested. If he bestows too much time on the ditches, the "line" and "surface" of the track become defective; if he puts in too much work on fancy ballasting, the ditches fill up and the embankments slough off. He must keep all these things in trim, nicely proportioning his work so as not to slight anything. He must have an eye that will detect a loose bolt, a broken rail, a rotten tie or a loose rock liable to descend upon the track, instantly. Although often a dull, plodding fellow, let us give him credit for an acuteness on the subject of track that even college graduates do not possess. (N. B.—I am a college graduate.)

If there is any information in the foregoing, it did not originate with me. My knowledge of track is exceedingly limited. I say so modestly, but decidedly. I do not wink as I make the remark, I am learning slowly. The best of it is that I learn most from men who spell thus: i ned a hundered kros tis—send sune." P. GREEN.

The Operating Department and Management of a Railroad.

III.

In selecting officers for a railroad many important points should be considered. Personal characteristics often form nearly as important a part as the amount of ability and the experience one has had. One man will make a success in one community, while it is quite possible for him to make a failure in another, through no intention or change of plan of his own. Of course, his failure would be caused by his trying to make everything fit his ideas, rather than fitting his to suit the majority. I am now dealing with a very delicate subject, and I do not propose to take either side, only to say what I think may assist some one in future in making selections. Do not put men and families in uncongenial social neighborhoods. This rule applies both ways. Many wise old gentlemen shut their eyes to facts on the basis that business is business and social standing has nothing on earth to do with such matters. Let me say to them in a very friendly way that they pay the bill every time they make such a mistake. A railroad is generally the most, or one of the most, important portions of a town or city wishing and asking friends both to gain business and for protection against all kinds of inroads from the citizens. Therefore it is necessary to place such officers at each point as can accomplish the best results. It is just as impossible to change the nature and bringing-up of the officers to suit the prominent citizens as it is for the latter to suit the former. Of course this is more often the case with young officers than with older ones, for two reasons: Older officers and families, as a rule, have learned by sad experience to adapt themselves to their surroundings, and communities do not make the same demands on them as on the younger ones. They are also more considerate with age. The places are nearly equally divided, so there is little excuse for making such mistakes. There is room for all, each man to his place. Then by all means put him there. He is happier and does the service required of him with a cheerful heart.

Many successful division superintendents have been made from every class of railroad employés, and I do not wish to take the credit from those who have mastered many difficulties with few advantages other than pluck and common sense. Still the majority of successful division officers have so far been taken from the profession of civil engineering. Young engineers taken from colleges or other institutions at the very start, that is, as soon as they have graduated, and put through a proper course of instruction, should, by their education and experience, be the most valuable, by reason of their having the proper discipline to enable them to learn intelligently and fully comprehend the meaning of each step, not working in the dark for years or by the rule of thumb. They also have naturally much greater capacity for learning. In addition to this there is generally a love for the profession and for such work in men who select this calling which drives them much faster and farther than men of no education, or those who go into railroading simply because they think it will pay them better than other classes of work within their reach, or because nothing else is open to them at the time. The boy is what you need, not the older engineer, with fixed ideas and schemes and plans of his own—a sort of general confusion of water works, Flood Rock explosions, land surveying, and many other things, mixed up with some railroad construction some time in his earlier life. In these cases the railroad generally suffers, as he considers it the least important, and can really never get his mind down to the smaller necessities which make the whole. Let the young man or boy start as he should—out on the track; Assistant Supervisor is the best place, as the lower position of track foreman necessitates his handling laborers, which he is not fitted for. Let him work himself gradually up, as he becomes familiar with his duties, through each grade—Supervisor, Road Master, and Assistant Engineer—with some experience in either the Roadmaster's or Assistant Engineer's office during his time of service, as clerk, draughtsman, etc. You will have a pretty well educated trackman if he takes the proper interest and shows the needed ability. If he does not, drop him from your rolls as soon as you find he is not worth educating. If he is a desirable person, by the time he has reached the standing and age in service which would entitle him to consideration for the next vacancy as a Division Superintendent, you will find he is very well posted about the duties of that office and thoroughly in love with his profession, which is changed from civil engineering to railroading—for the latter is in reality as much of a profession to-day as any other calling, and is entitled to the same respect. The positions of General Superintendent and members of his staff, should be filled from the Division Superintendents and Master Mechanics. While many good officers have been made from other branches of the service they have been exceptional men, and in such cases as a whole they have been anything but successful; and it is hardly just to them to expect that they should be without the needed education. How can a man instruct others when he has had no chance to learn by experience what he wants done in a business so largely made up of experience? This rule will apply also to the mechanical engineer and master mechanic, starting the young educated mechanical engineer in the shops, then as gang foreman, and so on through the various positions attached to the shop, until he has been sufficiently instructed to be made Road Foreman of Engines (which, by the way, I believe to be the best use that can be made of that office, *i. e.*, to educate this class of employés), Shop Foreman, General Foreman, Master Mechanic, and Mechanical Engineer. He may at this point be a rival of the Chief Engineer for the position of General Superintendent. SUPERINTENDENT.

The Sukkur Bridge Over the Indus.

We are indebted to the London *Mechanical Engineer* for the accompanying engraving, which represents the large cantilever bridge to be erected over the Indus at Sukkur, and which is in course of construction in the yard of Messrs. Westwood, Baillie & Co, London.

The bridge is on the cantilever principle, the gap between the ends of the cantilevers being bridged by a lattice girder of 200 ft. span. Of the two main uprights, only one rests on the pier, the other one being suspended, which necessitates the introduction of two inclined members, projecting from the pier as shown.

The following are the principal dimensions and particulars of the bridge: Clear span between abutments, 790 ft.; span between centres of bedplates, 820 ft.; centre span (clear), 124 ft.; extreme height of cantilever from under bedplate, 173 ft.; height of rail from under bedplate, 40 ft.; length of back guys, 280 ft. and 300 ft.; width of bridge between centres of main members at bedplate, 100 ft.; width of bridge between centres of main members at end of cantilever, 20 ft.; width between centres of back guys, 20 ft.

The bridge is for a single line of railway of 5 ft. 6 in. gauge. It is to be entirely constructed of mild steel plates and bars ranging from 1¼ in. to ⅞ in. in thickness, riveted together with steel rivets. The long struts are rectangular in section, each corner of the rectangle consisting of a curved plate with angle-bars on its edges, and the faces of the rectangle being occupied by transverse and diagonal bracing. Lengthwise the struts are curved on all four faces, tapering from the middle toward the ends. The roadway girders are of steel plates 4 ft. 6 in. in depth, and at a uniform distance of 20 ft. apart; the cross girders are spaced 8 ft. apart. The floor of the bridge is of corrugated steel plating.

The back guys are, of course, more heavily strained than any other members, the stress provided for in each of the two guys of the cantilever amounting to 1,200 tons. This stress arises from a load of 300 tons on the nose of the cantilever, imposed by the centre span, from the dead weight of the cantilever itself, from a rolling load covering the cantilever, and from wind.

The anchors are buried in a large mass of concrete, and are built up of steel plates and angle bars. Each anchor measures 32 ft. by 12 ft. in a plane at right angles to the line of stress. The total weight of steel in the two cantilevers (including the back guys and anchors, but not including the central span) is nearly 3,000 tons.

The bridge has been designed by Mr. A. M. Rendel, of No. 8 Great George street, Westminster, Consulting Engineer to the Indian government.

RAILROAD GAZETTE

Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

RAILROAD SECURITIES AND MR. VANDERBILT'S WILL.

In the will of the late Wm. H. Vanderbilt some significant facts are disclosed which seem to have escaped attention. It is worth while to note the nature of the investments (so far as disclosed by the will) bequeathed by him, compared with those which formed his father's estate. His father died just after the close of the great trunk-line railroad war of 1876, which first reduced the profits of the New York Central Company below $8 per share, and made it evident that the great through business might often be made unprofitable, and that risks attended New York Central as well as other stocks. Up to that time the stock of this company had been quite generally regarded very much like a bond. The experience of 1876–77 showed to every careful observer that this stock was vulnerable; but as the 8 per cent. dividend was paid regularly then and through other years of struggle and loss, probably the less thoughtful investors—a very large body—were only strengthened in their opinion that New York Central stock was invulnerable. Whatever Commodore Vanderbilt's opinion, he held on to his stock, and when he died had, so it was universally said, more than half of it—that is, at least $45,000,000 at par, and it was worth but little above par then—just about the same as when his son died last week. It was also understood that he had a very large proportion of the Lake Shore stock, and that of his great fortune, estimated at from $80,000,000 to $100,000,000, comparatively little was in bonds. He seemed to have convinced himself that stocks of railroads managed by their owner were a good and safe investment, but that control was indispensable, and that ownership only would give control, for we do not hear that he held shares in other companies than his own.

Less than nine years have passed, and Commodore Vanderbilt's heir dies and leaves a fortune estimated at from $160,000,000 to $200,000,000, and so far as known the larger part of it is not in stocks, but in bonds, and it is expressly stated, by his most intimate advisers, that he did not own a controlling interest in the stocks of any of his roads. It is true that we have no means of knowing what a large part of the estate consisted of. But the securities specified in the will were worth at the market price last Saturday just about $94,500,000. There are a few millions of real estate, and it is altogether probable that the unspecified remainder of the estate, which goes to the two elder sons, includes considerable amounts of bonds, as the seconds of the New York, Chicago & St. Louis, for which there was no market, and the certificates exchangeable for bonds of the new West Shore Railroad Company. At most, it seems that the *value* of the stocks left by Wm. H. Vanderbilt can scarcely be more than of the stocks left by his father, so that the whole increase of the fortune was invested in other securities than railroad stocks. But a considerable part of this value may be due to an advance in prices. Lake Shore shares were worth less than 58 when Commodore Vanderbilt died, but were selling at 88 when William H. died. Harlem, of which the Commodore owned a great deal, has risen from 141 to 210. We know that a very large part of the New York Central shares were sold at a price much above what they bore when the Commodore died, and it is probable that the holdings of Lake Shore and of Michigan Central (acquired since the Commodore's death) were reduced when prices were much higher than they are now. The chief acquisitions of shares so far as known consist of Chicago & Northwestern shares, which, though selling for less than at some times heretofore, are worth nearly three times as much as when Commodore Vanderbilt died, and doubtless very much more than when Wm. H. Vanderbilt bought most of his holdings.

Now, all this indicates that Mr. Vanderbilt and his advisers, who managed the companies whose stocks he held, and were safe, as it impossible for small holders to be, against a depreciation of stocks by the incapacity or dishonesty of managements, who had the completest knowledge of changes of business likely to affect prices, enabling them to sell when prices are likely to fall and before they have fallen, and to buy when they are likely to rise and before they have risen—all this, we say, indicates that Mr. Vanderbilt and his advisers were convinced that, for him, at least, railroad shares are not—at least, of late were not—the best form of investment.

Yet if shares are a good property for any one to hold, for whom so good as for the great capitalist whose income vastly exceeds his expenses? As William H. Vanderbilt left his widow a yearly income of $200,000 and his magnificent home, we may assume that this sum is sufficient to carry on that, the finest establishment in the land. But each of his eight children has from his estate the income from $10,000,000 of securities, the present market value of which is $11,750,000, and the income from which will probably be as much as $500,000. Indeed, the income from the $5,000,000 of securities held in trust for each, all first-class bonds, is very nearly $250,000. Thus, if there was any man in the land who could safely invest the larger part, or the whole, of his estate in shares the income from which must naturally fluctuate, it was Wm. H. Vanderbilt, and in a less degree this is true also of his family. It is not important to them that their income should be regular, as it is to those who live nearly up to their incomes. Millionaires are precisely the persons in whose hands properties which make fluctuating returns should be expected to fall. A man who needs to meet his expenses an income of $3,000 a year from his capital, if that capital is $60,000, will not be likely to invest it in stocks which pay 8 per cent. some years and nothing in others, though their *average* return has been and is likely to be 6 per cent. or more, because he will not have enough to live on in the bad years; but if, with the same expenses, his capital were two or three or more times as great, then he might safely invest in the stocks, and would in the long run gain greatly by so doing. That is, risky enterprises and investments are safely and profitably undertaken by those who can bear losses.

Now, when we find that a capitalist with the best sources of information, and better able to take risks than any other living man, has virtually invested all his gains, and probably much more than his gains, in bonds instead of shares, the natural inference is that he had decided that the bonds were likely to be actually more profitable than the shares in the long run, and not merely to make more uniform returns, which to him was entirely unimportant; and if this was his conclusion, it is a most significant fact. For a time it was undoubtedly true; he who sold shares in 1880 and 1881 and invested the proceeds in bonds made great profits; but the investments of an estate of more than a hundred millions are not changed to meet the vicissitudes of two or three years.

The reason given for parting with the control of the New York Central was, that there would be less public jealousy if the holders of the stock were more numerous; and, doubtless, so far as hostile legislation is concerned, the greater the number of shareholders in the community, the greater the opposition to measures likely to reduce profits; but unless there had been some reason to suppose bonds would yield a better average income than stocks, one might have expected that part of the proceeds of the sales of shares would have been invested in the shares of other companies.

Commodore Vanderbilt left a great fortune to but one heir. That heir has left great fortunes to eight children, four of them daughters; and it could not wisely be assumed that all the sons would have the ability, or if the ability, the disposition, to manage great railroad systems. This was a reason for investing a very large part of his fortune in such a way that it might be safe for persons not active in railroad management; but if railroad shares are not suitable investments for persons whose brothers manage the companies whose shares are held, what are they for the average member of the community who has no brothers nor acquaintances among railroad managers? Does not this look like a declaration by Mr. Vanderbilt that bonds yielding 3 to 5 per cent. interest on their market prices are better investments than the New York Central, Lake Shore and Northwestern common stock, even for persons whose brothers manage these very companies, or at least exercise a great influence on their management?

In the $40,000,000 of securities (market value $49,200,000) left in trust to the eight children, there are no stocks; in the $40,000,000 (market value $44,100,000) left directly to them are $2,000,000 of Pittsburgh, McKeesport & Youghiogheny stock, guaranteed by the Lake Shore and the Pittsburgh & Lake Erie, and so nearly equivalent to a bond; $3,000,000 of Chicago & Northwestern preferred, which also ranks near bonds for safety; and the only common stocks are $4,000,000 of New York Central, $5,000,000 of Lake Shore and $2,000,000 of Michigan Central, which together make up but $9,700,000 of the *market value* of $94,500,000 worth of securities named in the will.

These shares probably were the smaller part of those held by the estate. It was, of course, proper that the residuary legatees, who are active railroad managers, should have the stocks, which enable them or help them to keep control of their roads and to be benefited by their exertions as managers. It is altogether reasonable that, in the division of an estate, those who are to conduct an inherited business should take their share, or a large part of their share, in that business; and it is very much better for the other stockholders that this should be so; otherwise, in this case, we might have the Vanderbilt railroads managed by persons whose chief interest would be not as proprietors but as creditors of the companies. Of course we cannot know how much of the residuary estate consists of railroad stocks, but probably it includes much more than the $11,000,000 of common stock named in the will. The two brothers together have nearly the same interest in making the stocks of their companies profitable, and, for that matter, in sustaining their credit against "bear" attacks, as their father, but not the same means by the $40,000,000 of choice securities left as trust funds for the eight heirs, and the $30,000,000 of other securities left absolutely to the other six children, plus the amount necessary to yield the widow's annuity, which is $5,000,000 of a 4 per cent. security. Counting by market value, we may say that their resources available in the market are $87,000,000 less than their father's; but as these available resources amount to $11,000,000 worth of securities, plus the excess of the estate over $97,500,000 plus their indivdual fortunes before their father's death, they will still have great power in the market, and perhaps as much as their father ever actually exercised.

Against the inference from Mr. Vanderbilt's accumulations of bonds instead of stocks that he believed the bonds would bring the larger income, it may be argued that a man worth a hundred millions or more may be satisfied with small profits, which may be true of some men, but seems not to have been of Mr. Vanderbilt. It may reasonably be urged, however, that his great holdings were in New York Central, Lake Shore and Michigan Central, that there were special causes which a few years ago threatened permanently to reduce the profits of these particular roads, and has actually reduced them; that sales were wisely made then, and that the prejudices of himself and his father were likely to prevent his investing in the stocks of companies which he did not manage; besides which, at the time these shares were sold, the prospect was for a general fall in prices of stocks, which has actually occurred. According to this argument, Mr. Vanderbilt sold his stocks to save himself from losses, and invested in what was most likely to preserve its value when stocks went down. This, as things have turned out, was a wise policy; but it appears that Mr. Vanderbilt did not mean to change back his bonds for shares, when the latter should be at their lowest, otherwise he would not have devised the bonds specifically, as he did to the amount of about $85,000,000 more than a year before his death.

What reasons he may have had for thinking that the income from an investment in bonds was likely to be larger than from an equal investment in stocks is well worth considering, but there is not room for it here.

FORTY YEARS OF MAINTENANCE OF WAY.

The following table, giving the cost of maintenance of way and of rolling-stock, on five leading lines for some 35 years past, illustrates beyond the need of many words the singularly persistent equality of ratio in the growth of maintenance of way and of rolling stock expenses discussed last week. It may be well to specify anew, however, just wherein the singularity consists.

It is not denied, of course, that there has been in almost every one of the last twenty years a very great decrease in the cost of maintenance of way *and of everything else* per unit of traffic (ton-mile or passenger-mile). Measured in this way, it is a matter of universal knowledge that the decrease has been enormous and continuous. These figures, showing the receipt, expense and profit per ton-mile on the Pennsylvania Railroad (Philadelphia to Pittsburgh and branches) averaged by half-decades from the beginning of its operation, will illustrate this truth as well as any:

	Cents per ton-mile.		
	Receipts.	Cost	Profit.
1854-5	3.050	1.980	1.070
1856-60	2.248	1.382	0.866
1861-65	2.260	1.462	0.798
1866-70	1.910	1.362	0.548
1871-75	1.307	0.790	0 517
1876-80	0.893	0.503	0 390
1881-84	0.794	0.457	0.337

In the enormous decrease here shown, maintenance of way has shared like everything else, *but no faster*, and therein lies the peculiarity.

This is strikingly illustrated by the following Table I., in which the expenses in cents per train-mile for maintenance of way and of engines and cars on each of five leading lines are compared for years a decade apart from 1860, with figures from the latest report at hand to bring the record to the present day.

During this period the *weight* of trains and engines and the number of cars per train, as well as the average load, has very greatly increased, as is evidenced by Table II. below, so that the cost of maintenance of engine and cars *per train-mile* should naturally tend to increase, prices and other things being equal. On the other hand, the cost of maintenance of way *per train-mile* should naturally (to all appearance) have fallen materially, both relatively and absolutely, for three good reasons:

1. In these years steel rails have been substituted for iron, effecting an enormous direct economy.

2. The traffic, as measured by train miles per day, has multiplied from four to seven-fold, so that all those large expenses for maintenance of way which are, or apparently ought to be, unaffected or little affected by traffic—maintenance of road-bed, ties, ballast, fences, crossings, bridges, buildings, right of way, culverts, track-walking, etc., etc.—should be diminished to something like one-fourth or one-seventh as much *per train-mile*, or at least be very heavily diminished.

3. Even that part of maintenance of way which might be expected to vary with traffic as directly as repairs of rolling stock—chiefly wear of rails and frogs—should certainly not increase *any faster* than repairs of rolling stock, not even if rails were still of the same material, which they are not. The heavier engines and cars might indeed wear rails more per train-mile—and no doubt do—but no faster than they increase cost of maintaining rolling stock per train-mile. In fact, they should not nearly as fast, first, because steel has been substituted for iron, and second, because it is *the engine* which causes most of the wear of rails and injury to line and surface. Statistical and theoretical evidence of a convincing character exists that the engine alone causes upward of half the wear of rails and track, and it is, moreover, now rarely disputed that the heavier modern types of engines, owing to their distribution of weight on more wheels and other causes, have not increased rail wear and track wear in anything like equal proportion to their increase of weight.

We have therefore this contrast:

1. Maintenance of engines and cars ought to have increased very materially per train-mile in the last 30 or 40 years, cost of labor and material being the same.

2. Maintenance of way ought (superficially) to have decreased materially per train-mile in *every* item, and in some (more than half the total) ought to have been very nearly independent of traffic and so have fallen to something like half or a quarter as much per train-mile, while the number of trains was doubling or quadrupling.

From these two facts it follows that the *proportion* of the maintenance of way charges per train-mile to the rolling-stock charges ought, *prima facie*, to have fallen very heavily indeed, so as to be only one-fourth or one-third—at most not over one-half—what it was 20, 30 or 40 years ago.

What are the facts? The facts are that nothing of the kind has occurred or (so far) shows any noticeable tendency to occur. Maintenance of way, as a whole, does *not* become proportionately less costly. What is saved perhaps in one item is spent in another, but at any rate the aggregate does not tend to decrease, compared with the cost of rolling stock (which of course varies more directly with the growth of traffic than any other item). This is shown conclusively by many evidences, of which Table I. below is one; while others appeared last week:

TABLE I.

Trunk Line Maintenance Expenses in Cents per Train-mile by Decades for 34 Years.

	Miles run, thousands.	Expenses per train-mile. Maintenance of				Total expenses per train-mile.	Percentages.		
		Way	Engines	Cars.	Total rolling stock.		Track	Engines	Cars.
N.Y.C.& H.R.		cts.	cts.	cts.	cts.	cts.			
1860	4,493	19 8	9.0	8.9	17.9	95.2	20.8	9.5	9.4
1870	11,430	39.8	9.8	15.4	25.2	122.2	32 6	8.1	12.6
1880	16,654	18.9	5.8	14.4	20.2	107.5	17.6	5.4	13.4
1884	16,453	24.8	5.3	10.3	15.6	108.6	22.8	4.8	9.5
Erie.									
1860	3,475	24.1	9.0	11.7	20.7	94.6	25.5	9.5	12.4
1870	9,326	39 6	14 1	12.0	26.1	129.5	30.5	10.9	9.2
1880	11,452	20.7	5 1	8.0	13.1	108.5	19.0	4.7	7.4
1884	11,305	18.2	4.4	8.9	13.3	106.8	17.0	4.1	8.3
Penna.*									
1860	3,633	21.4	7.7	8.2	15.9	99.3	21.5	7.8	8.3
1870	10.185	30.1	9.1	11.7	20.8	110.6	27.2	8.2	10.6
1880	17,241	14.5	7 2	10.5	17.7	81.8	17 7	8.8	12 9
1884	21,491	15.8	7.0	11.4	18.4	81.8	19.3	8.6	13.9
Balt. & Ohio.†									
1860	3,831	15.9	6 8	8.7	15 5	51.8	30.7	13.1	16 7
1870	7,941	26.3	6.9	5 5	12.4	68.8	38.3	10.1	8.0
1880	12,768	18.3	9 4	20.6	30.0	82.0	22.3	11.5	25.1
Phil & R.									
1860	1,853	11.2	8 6	8.9	17.5	78 6	16 5	10.9	11.3
1870	5,100	22.6	8.6	13.5	22.1	108.2	19.3	7.4	11 9
1880	7,799	26 3	7.8	12.1	19.9	117.5	22.4	6.7	10.3
1883	12,347	19.1	7 9	14.1	22 0	117.2	16.3	6.8	12.0

* Pennsylvania Division only.
† Main stem and branches.

In this table, it will be noted, an enormous expansion of train mileage has occurred, ranging from four to seven-fold, while yet the cost of maintaining track has, on the whole, decreased less rapidly than other maintenance expenses. There has been, on each of these lines, a considerable expansion of track mileage as well as train mileage, but this increase has been of branches only, not of main line. Therefore, while due allowance for the effect of this greater trackage would reduce, it will not seriously modify the striking contrast in number of train-miles per year shown above, in spite of which maintenance of way has decreased, by comparison with other items, so little.

The moral from this table may be more conveniently studied in Table III. below, but as showing that there is nothing abnormal nor exceptional about the table, either from the single years given being exceptional or otherwise, we may first present the following Table II., in which the experience of the Pennsylvania Railroad only is carried back 10 years further, to the very beginning of its operation, and *every* year's experience is included, the years being averaged together by half-decades to eliminate accidental variations and shorten the table. In this table, but not in the preceding, fuel stores and engine wages are included with repairs of engines and cars in the single item "motive-power and cars," greatly increasing the surprising features of the contrast:

TABLE II.

Operating Statistics of the Pennsylvania Railroad (Main line and Branches) averaged by half decades from the Beginning of its Operation.

Years averaged.	Miles run, av. th'ands.	Train load E. only. Tons.	Per cent. of total exp.		Per cent. Mt. way of motive power and cars.
			Motive power and cars.	Maint. of way.	
1851-55	1,416	101.6	42.3	13.4	31.7
1856-60	2,934	110.6	42.9	23.7	55.4
1861-65	5,530	146.24	48.1	22.8	47.5
1866-70	8,766	158 88	41.4	27.2	65.6
1871-75	14,368	187.76	38.2	23.4	61.5
1876-80	16,182	251.32	39.4	18.4	44.3
1881-84	20,808	298.45	41.7	20.0	48.0

The last column contains the pith of the comparison. So far as statistics of one road can prove a thing, it is all but proof positive that the cost of maintenance of way neither decreases nor tends to decrease, relatively to other expenses, under enormous expansions of traffic. The very exceptions (apparent exceptions) in the table prove the rule, not only because they are exceptions, but directly. Compare, in proof of this, the steady growth of the *comparative* cost of maintenance of way during the first five half-decades, during which the traffic, as measured in train-miles, increased more than ten times (on main line only, about nine times). Lately, within the last fifteen years, there has begun a sudden change, but this is plainly due, not to the growth of traffic under the same conditions, but to the introduction of steel rails, and the change is far less than ought to result from that cause alone, for the use of steel has prolonged the life of rails from 10 to 20-fold.

In the last half-decade there has been a rise again, following the law which prevailed before the introduction of steel rails, so that in the half-decade which is just closing maintenance of way has been 48 per cent. instead of 44 per cent. of motive power and car expenses, although the train mileage has averaged about 30 per cent. greater. Moreover, even now, in the present decade, with all the advantages of steel rails and a traffic nearly four times greater in trains and eight times greater in tonnage, the relative magnitude of the maintenance of way charges is as great as 20 years ago, in 1861-65.

Testing how nearly these conditions obtain with the other trunk lines, we may deduce from Table I. the following Table III., showing the comparative ratio of maintenance of way to repairs of engines and cars only, *not* including with the latter fuel, stores and engine wages:

TABLE III.

Comparative Cost of Maintenance of Way on Each of the Five Lines in Table, **Cost of Repairs of Engines and Cars being $1.90.**

	N. Y. Cen.	Erie.	Penna.	B. & O.	P. & R.	Average.
1860	1.11	1 16	1.33	1.025	0.64	1.053
1870	1.58	1.51	1.45	2.12	1.02	1.536
1880	0.945	1.58	0.82	0.615	1.32	1.056
1884	1.59	1.37	0.86	....	0 87	1.172
Average	1.306	1.405	1.115	1.915	0.962	1.199

NOTE:—The contrast in the proportionate cost of maintenance on the various roads is in part genuine, but in part, no doubt, results from considerable difference in what items are included in "maintenance of way" or of cars or engines. Less pains was taken in this respect than to have the comparison of one year with another correct for each road separately.

The last column of this table is the most instructive for the immediate end in view. It gives the average expenditure on maintenance of way in dollars on all the five great roads, for each dollar spent on repairs of locomotives and cars. With the exception of 1870, which was an abnormal year, it will be seen that the tendency of maintenance of way to *increase* in relative importance, in spite of an immense growth of traffic, is marked and clear.

We had intended presenting considerable further data on this subject, which is one not unworthy of attentive consideration, but the foregoing must suffice. By data running still further back the same condition of things can be shown to exist in England and on other roads in this country.

The New York Central's Last Fiscal Year.

The statement of the earnings and expenses of the New York Central & Hudson River Railroad for the quarter ending Sept. 30, received just as we go to press, completes the figures for the company's fiscal year. For the quarter—which was probably the most unfavorable one the trunk lines have ever had—the figures are:

	1885.	1884.	Inc. or Dec.	P.c.
Gross earn.	$6,053,415.43	$7,162,878.95	— $1,109,463.52	15 5
Expenses and taxes	4,500,207.05	4,716,363.13	— 216,156.08	4.6
Net earn.	$1,553,208 38	$2,446,515.82	— $893,307.44	36.5
Inter't, rents, etc.	1,463,726.59	1,445,595.66	+ 18,030.93	1.2
Profit	$89,481.79	1,000,920.16	— $911,438.37	91.0
Dividend	447,141.50	1,793,825.72	— 1,346,684.22	75.9
Deficit	$357,659.71	$792,905 56	— $435,245.85	54.9
Profit per share	10 cts.	$1.12	— $1.02	91.0

Thus the profits of the quarter were reduced this year to next to nothing—10 cents per share; and doubtless a continuance of the condition of things then prevailing would have extinguished dividends forever. The comparison with last year, bad as it is, does not show the whole loss, because the quarter was extraordinarily unfavorable last year, the profit per share usually having averaged as much as $2 per quarter.

For nine fiscal years the figures are:

Year to Sept. 30.	Gross earnings.	Expenses.	Net earnings.	Prior charges.
1885	$24,429,441	$16,319,372	$8,110 069	$5,933,727
1884	28,148,669	17,849,313	10,299,356	5,630,596
1883	33,770,722	20,750,594	13,020,128	5,692,972
1882	30,628,731	19,395,974	11,232,807	5,488,903
1881	32,348,397	19,464,787	12,883,610	4,990,783
1880	33,175,913	17,849,894	15,326,019	4,756,749
1879	28,396,584	16,123,073	12,273,512	4,679,025
1878	28,910,555	16,135,977	12,774,578	4,736,132
1877	26,579,086	14,946,162	11,632,924	4,689,577

The decrease compared with last year is:

	Gross earn.	Expenses.	Net earn.
Amount	$3,719,228	$1,529,941	$2,189 287
Per cent	16.8	8.6	21.2

Compared with 1883 the decrease is:

	Gross earn.	Expenses.	Net earn.
Amount	$9,341,281	$4,431,222	$4,910,059
Per cent	27.7	21.3	37.7

The largest net earnings were in 1880, and the decrease since then is $7,215,950, or 47 per cent.

The profit over fixed charges in gross and per share has been meanwhile:

Year to Sept. 30.	Total.	Per share.	Year to Sept. 30.	Total.	Per share
1885	$2,176,343	$2.43	1880	$10,569,220	$11.82
1884	4,668,760	5.22	1879	7,594,486	8.49
1883	7,327,156	8.19	1878	8,038,446	8.98
1882	5,743,904	6.42	1877	6,943,347	7.76
1881	7,892,827	8.82	1876	7,213,076	8.06

Thus, the divisible profits last year were 53 per cent.

less than the year before, 70 per cent. less than in 1883, and 80 per cent. less than in 1880.

The chief changes in the balance sheet since last year are an increase of $588,000 in the amount due for wages, supplies, etc., of $1,063,000 in amounts due other roads, etc., and a decrease of $779,000 in the cash on hand.

The Ohio Supreme Court has sustained the decision made some time ago at Cleveland, that a railroad company may not make a discrimination of rates in favor of large shippers, and declares that "when the lower rate is either intended to give, or has the necessary effect of giving, an exclusive monopoly, affecting the business and destroying the trade of other shippers, the latter have a right to require an equal rate for all under like circumstances." We congratulate the railroads on this decision. If this had been recognized as the law ten years ago, it would have saved them from great losses, as well as from much well-deserved odium. What it has been extremely difficult to avoid ought to be rendered easy now wherever the laws of Ohio prevail.

More November Earnings.

The 29 railroads whose November earnings were reported last week earned in the aggregate $15,173,350, which was $1,240,143, or 9 per cent., more than last year. This week we have reports from 27 more railroads, but their aggregate earnings were only $5,620,116, which is $180,964, or 3⅛ per cent., more than last year. The 56 roads together had in November:

	1885.	1884.	Increase	P. c.
Earnings	$20 793,466	$19,37?,359	$1 42?,107	7.3

which, though less favorable than the returns of the roads reporting the first week, is still a very great improvement over last year, and if November had not been exceptionally unfavorable last year, we might say that the month this year was positively a very good one. This, however, cannot be said. We have seen the statement that November earnings were much larger than ever before. This is not true. Fifty of the 56 roads that have reported up to this time this year reported also last year. Then these 50 railroads earned in the aggregate $1,539,840 less than in the corresponding month of 1883; this year they earned $1,313,412 more than in 1884, and therefore are still $226,000 behind their 1883 earnings. They have not a much greater mileage than last year, but the increase over 1883 is considerable, about 3,400 miles. But November was hardly to be called a favorable month in 1883 even, for though the aggregate earnings of the railroads were greater then than in 1882, their earnings per mile were smaller by 4 per cent. It is not because November earnings are large this year that they are encouraging, but because they show that the general downward course has ceased and an upward course begun.

We give below the November earnings of the more important roads reporting this week for five successive years, and comparisons of gains and loss with those in months previous to November.

The November earnings of the St. Paul, Minneapolis & Manitoba have been:

1881.	1882.	1883.	1884.	1885.
$508,530	$913,334	$?45,514	$870,440	$865 878

The earnings this year were but 1½ per cent. less than last year and were 2½ per cent. more than in 1883, but were 5½ per cent. less than in 1882.

The gains and losses in successive months this year have been:

Av. Jan. to June.	July.	Aug.	Sept.	Oct.	Nov.
	Dec	Dec.	Inc	Dec.	Dec.
$93 987	$51,809	$47.142	$2.259	$16,904	$13,562

Thus though there are decreases still, they are no longer enormous, as they were previous to September. The aggregate decrease for the 11 months, however, has been $690,182, or 9.2 per cent.

The Marquette, Houghton & Ontonagon, which depends chiefly on iron ore, reports for November:

1881.	1882.	1883.	1884.	1885.
$66,051	$90,891	$6?,129	$30,489	$48,576

The road has been lengthened from 87 to 160 miles in these five years, chiefly in the last two; but the extensions probably were not expected to have a great effect on traffic. The increase of 60 per cent. over last year is very satisfactory, but the earnings remain much below those of previous years. Its gains and losses, compared with last year, in previous months of this year have been:

Av. Jan. to June.	July.	Aug.	Sept.	Oct.	Nov.
	Dec.	Inc	Inc.	Inc.	Inc.
$9 865	$16.034	$?67	$14,?70	$45,012	$18,087

The decrease of $76,425 at the end of the first seven months of the year has been transformed into an increase of $183 by the gains of the last four months.

The Wisconsin Central's November earnings have been:

1881.	1882.	1883.	1884.	1885
$58,818	$60.224	$138,805	$127.154	$133,905

The increases in successive months have been:

Av. Jan to June.	July.	Aug.	Sept.	Oct.	Nov.
$319	$6.771	$3,4?6	$4 037	$5,?15	$3 751

This road is singular in having had an increase in every month since May, but also singular in having had a smaller increase in November than in most other recent months.

The St. Joseph & Grand Island has had gains and losses in successive months:

	July.	Aug.	Sept.	Oct.	Nov.
	Dec	Dec.	Inc	Inc.	Dec.
Amount.....	$8,080	$?4,825	$?52	$23 776	$5,?90
Per cent.....	11.7	1?0	0.3	?3 5	6.9

The total earnings naturally decrease from October to November, but that they should have fallen from $124,368 to $83,580 (33 per cent.), as they did, seems remarkable, especially as last year the decrease was but 11 per cent.—from $100,592 to $88,970.

The Denver & Rio Grande Western makes no such increase as the Denver & Rio Grande, the former's earnings having been:

1883.	1884.	1885.
$10?,686	$89 555	$95 ?95

The gain over last year is 6½ per cent. (while the Denver & Rio Grande gained 27 per cent.), and compared with 1883 there is a *decrease* of 11½ per cent.

The gains over last year in successive months have been:

Av. Jan. to June.	July	Aug.	Sept.	Oct.	Nov.
$10 ?33	$40 ?63	$9,?93	$18 ?04	$34,315	$5,870

Thus the gain was smallest in November.

The St. Louis, Fort Scott & Wichita has earned in November:

1883	1884.	1885.
$38.?34	$46,807	$66,?63

The mileage has increased from 160 in 1883 to 185 last year and 216 this year; the increase seems rapid, but the earnings per mile are still light—$310. Its gains in successive months have been:

Av. Jan to June.	July.	Aug.	Sept.	Oct	Nov.
$9,?25	$6,?31	$11 ?90	$15,904	$18.?40	$19.?06

The gain was slightly greater last month than the month before.

The Kansas City, Fort Scott & Gulf has earned:

1881.	1882	1883.	1884.	1885
$143,?10	$179,6?2	$193,?55	$?.9 4?6	$233,?35

There has been an uninterrupted increase from year to year on this road, and the gain over last year is 6 per cent.

The gains in successive months have been:

Av. Jan. to June.	July.	Aug.	Sept.	Oct.	Nov.
$14.?60	$9,?03	$17,?23 (Dec.)	$18,?93	$24,?48	$13,?19

The gain was less last month than the average for the year.

The Kansas City, Springfield & Memphis did not report last year. Its gains in successive months this year have been:

Av. Jan. to June.	July.	Aug	Sept.	Oct	Nov.
$49,?23	$6,?80	$13,?22 (Dec.)	$12,?85	$1?.?43	$4,?34

It also had a smaller gain in November than in previous months.

The Wabash, St. Louis & Pacific earned in November:

1881.	1882.	1883.	1884.	1885.
1,?72,?30	$1 ?25 ?15	$1.?5? ?30	$1.?2 ?,?13	$1,?07,?58

Comparisons with years previous to 1884 have little value, as the mileage for the last two years is but 2,373, while for 1883 it was 3,518 and but little less in the two previous years. The increase over last year is 7¼ per cent., and the first the road has had for a long time, the gains and losses in successive months having been:

Av. dec. Jan. to July.	Aug. Dec.	Sept. Dec	Oct. Dec.	Nov. Inc.
$41.?70	$?95,?31	$191.?15	$1??,?44	$82,?20

The change from these great losses to a considerable gain is a notable one, but this is largely because there was a tremendous drop last year from October to November ($340,856 = 22½ per cent.), which was altogether unprecedented.

A statement of the earnings of the Illinois lines and the Southern Division of the Illinois Central separately shows a gain of 6 per cent. on the Illinois lines and a loss of 10 per cent. on the Southern Division, the Illinois lines earning:

1881.	188?.	188 ?.	1884.	1885.
$572,?49	$583,?72	$6 ?,?43	$548,?96	$580,?34

In spite of the gain over last year the earnings were less than in 1882 or 1883. The gains over last year in successive months have been:

Av. Jan. to June.	July.	Aug.	Sept.	Oct.	Nov.
$22,?50	$3?,?01	$?,?62	$14.?62	$16 ?31	$31,?38

We have to go back to April to find any loss, and the average monthly increase for the past 11 months has been $23,513, which is above the average gain in the fall months. This line has been exceptional in having a gain nearly throughout the year, in this contrasting strongly with its near neighbor the Chicago & Alton, and also with its own Southern Division, which latter has earned in November:

1883.	1882.	1883.	1884.	1885.
$464,?56	$518.?57	$533,?88	$550,?78	$49 ?,?66

Thus the earnings were less this year than in any other since 1881 (and less also than in 1879). This is the more remarkable because there has been a large increase in the mileage of this division since 1883, so that its earnings per mile have fallen from $928 to $695. Scarcely any other Southern railroad, however, has as large earnings as the latter. The last three months of the year are the harvest time of this road. Its earnings were twice as great last November as last June. Its decreases in earnings in successive months have been:

June	July.	Aug.	Sept.	Oct.	Nov.
$?,?54	$?8,?44	$23,?09	$18 ?39	$12,?75	$56,?12

against an average monthly increase of $46,503 in the first five months of the year, which leaves a gain for the entire 11 months.

The course of earnings has been almost the opposite of what the crops indicated, the large earnings last year coming after an unusually light cotton crop, and the small ones this year after a large one.

The St. Louis & Terre Haute Main Line, which has been afflicted with a trunk line traffic (carrying the New York Central's St. Louis traffic), has had the following November earnings:

1881	1882.	1883.	1884.	1885.
$105,?06	$?55,?34	$?1,?22	$?04,?57	$103,?79

Thus the restoration of the through rates did not prevent this road's earnings being less this year than in any other of the five. The decrease from last year is trifling, but from 1883 it is 21½ per cent., and from 1882 33 per cent. But the decrease from last year was much larger in most previous months, having been:

Av. Jan. to June.	July. Dec.	Aug. Dec.	Sept. Inc.	Oct. Dec.	Nov. Dec.
$?,?82	$?.?43	$?,?18	$?83	$15,?83	$1 ?84

The Belleville Line of this company (being the northern half of the principal route between St. Louis and Cairo), has earned:

1881.	1882.	1883.	1884.	1885.
$64 ?.?9	$72,817	$?4 961	$60 854	$67,?50

There is a gain of 10 per cent. over last year, but a decrease of 10½ per cent. from 1883. In successive months it has had the following gains:

July.	Aug.	Sept.	Oct.	Nov.
$?,?92	$5,?62	$10.?52	$5.?41	$6,?96

Thus the gain was not larger than the average last month. In the first half of the year there was an average monthly decrease of about $5,500, and for the entire 11 months the net increase has been but $3,171, less than ½ per cent.

The Evansville & Terre Haute earned:

1881.	1882.	1883.	1884.	1885.
$?1 ?89	$6?,?42	$59 ?37	$60,?26	$64 ?84

Thus its November earnings were larger this year than ever before, and 7¾ per cent. more than last year. The gain of $4,658 in November may be compared with its gain of $7,161 in October, $1,299 in September, and an average monthly loss of $1,511 in the eight months previous. For the 11 months ending with November it has earned $1,031 more than last year.

The Flint & Pere Marquette reports:

1881.	1882.	1883.	1884.	1885.
$? ?.069	$203 ?42	$?.4,?17	$158.?15	$175 ?41

The gain, 11 per cent. over last year, still leaves the earnings 25 per cent. less than in 1883 and 14 per cent. less than in 1882. But it is a great change, as the earnings had been falling off seriously for a long time, the decreases having been:

Av. dec. from Jan. to June.	July. Dec.	Aug. Dec	Sept. Dec.	Oct. Dec.	Nov. Inc.
.47,?56	$?1,?83	$18 ?70	$4,?72	$9,?72	$17,?26

The little Cleveland, Akron & Columbus has earned in November:

1?81.	1882.	1883.	1884.	1885.
$38.?01	$43.?64	$41,?75	$37.?74	$35 ?94

showing smaller earnings this year than in any other since 1881, though the decrease from last year is but 3⅝ per cent. The road had a gain of $308 in October and of $1,340 in September, and for the eight months previous earned but $300 less than last year.

In the East the Boston, Hoosac Tunnel & Western reports earnings in November:

1883.	1884	1885.
$29,?45	$37,?39	$47,?22

showing an increase of 28 per cent. from 1883 to 1884, and of 27 per cent. from 1884 to 1885. Its earnings are still light, however, for an Eastern railroad with trunk-line traffic, being $546 per mile this year. The advance in trunk-line rates probably explains the fact that there was a gain of $9,883 in November, against a gain of $3,238 in October, and a loss of $1,893 in September, and an average monthly loss of but $833 in the previous months of this year. But then it is also to be remembered that the contest of the trunk lines in November first made serious impression on its earnings last year, which were $46,737 in September, $45,186 in October, and then fell to $37,639 in November.

The New York, Ontario & Western has not reported before this year. Its gains or losses in successive months of this year compared with last year have been:

July. Dec.	Aug. Dec.	Sept. Dec.	Oct. Dec.	Nov. Inc.
$533	$21 ?01	$18,?43	$16,?47	$2,?00

Thus the improvement in November over previous months is decided.

Turning now to the South we find the Mobile & Ohio's November earnings to have been:

18 1.	1882.	1883.	1884.	1885.
$?62,?86	$?01,?54	$?80,?62	$?58,?32	$?35,?02

showing smaller earnings this year than in any other, and a continuous decrease since 1882.

Its gains and losses in successive months have been:

Av. dec. Jan. to June.	July. Dec.	Aug. Dec	Sept. Dec.	Oct. Inc	Nov. Dec.
$8,?06	$11,?30	$10 ?99	$?79	$13.?19	$17.?30

The loss was larger in November than in previous months.

The Texas & St. Louis, which has not reported before this year, has a gain of 33 per cent., from $130,?96 to $172,953, in November, and has gained in successive months:

Av. Jan. to June (Dec.)	July.	Aug.	Sept.	Oct.	Nov.
$?,?81	$?.?17	$8,?22	$?51	$28,?76	$42,?57

The gains have become very great since the new cotton crop began to move freely.

The early report of the Norfolk & Western omits important parts of the earnings, so that a comparison with years previous to 1884 would be unduly unfavorable. Thus, the yearly report for last October gave the earnings as $262,394, while the full report made it $285,965. And the November report now made gives for comparison only $230,296 of the $244,810 which formed the total. The incomplete report shows a gain this year of $17,326, or 7½ per cent., against a loss (by the complete report) of $2,530 in October, $2,637 in September, an *increase* of $21,996 in August and $24,443 in July.

The Richmond & Danville has earned:

1881.	188?.	188?.	1884	1885.
$3?7,?11	$?02,?22	$363,?04	$371,?76	$362,?.00

Thus the earnings have varied but little from year to year, but are slightly less this year than in any other of the five.

The increases and decreases in successive months have been :

Av. inc. to June	Jan. inc.	July. Inc.	Aug. Inc.	Sept. Inc.	Oct. D c.	Nov. Dec
$5.673	$21,354	$29,813	$45.646	$8.300	$8,776	

Thus this road is not doing so well now as earlier in the year.

Of the five roads controlled by the Richmond & Danville, the Virginia Midland and the Western North Carolina have large gains over last year, and the Georgia Pacific a small one, while there is a decrease of 8 per cent. on the Charlotte, Columbia & Augusta, and of 11½ per cent. on the Columbia & Greenville. The five roads together had an aggregate loss of $1,725, against a gain of $43,260 in September, $11,110 in August, $10,867 in July, and an average monthly gain of $9,086 in the first half of the year.

The Florida Railway & Navigation Co. has earned in November :

1882.	1883.	1884.	1885.
$86 293	$102,829	$89,232	$108.213

The increase over last year is 20 per cent., and over 1883 5⅛ per cent.; and against this gain of $18,981 in November there was a gain of $620 in October, of $4,241 in September, and some gain in every month since June, and a small loss in the first half of the year.

On the whole the Southern roads do not make a very good showing in November.

Chicago through rail shipments eastward for the week ending Dec. 12, by the incomplete report, including only flour, grain and provisions, this year and last, but by the complete report, including all classes of freight except live stock in previous years, have been, in tons :

1880	1881	1882.	1883.	1884.	1885.
48 602	54 325	49,335	54,196	65,353	40.215

Thus the shipments this year are nearly 40 per cent. less than last year, and, allowing for the higher classes, probably about as much as in 1883 and 1881, and more than in 1882, but less than in 1880.

The total shipments and the percentage going by each railroad in each of the last six weeks have been :

	Week ending.					
	Nov. 7.	Nov. 14.	Nov. 21.	Nov. 28.	Dec. 5.	Dec. 12.
Tons :						
Flour	3,915	4.571	4,246	6.534	8,216	5 274
Grain	14.080	15.114	18,676	36,246	22 569	23,342
Provisions	8.991	9,695	11,593	11,537	10.443	11,599
Total	27,586	29,890	34,525	54,317	41,228	40,215
Per cent. :						
C. & Grand T.	11.4	10.7	8.6	14 2	16.5	12.3
Mich. Cen	18.4	19.8	20 0	17.6	18.0	19.0
Lake Shore	15.1	15.5	13 8	11.2	15.4	13.9
Nickel Plate	7 9	11.1	12.4	10.9	8.3	9.8
Ft. Wayne	21.0	17.5	19 8	14.3	21.1	15.9
C., St. L. & P.	11 4	15.6	14.4	9 8	10 8	12 4
Balt. & Ohio	7.4	7.9	6 2	6.2	7.7	9.8
Ch. & Atlantic	7.4	3.9	4.8	5.8	2.2	6.9
Total	100.0	100.0	100.0	100.0	100.0	100.0

Thus the total shipments last week were 2½ per cent. less than the week before, but the falling-off was wholly in flour, the shipments of which were exceptionally large the week before. Against a decrease of 36 per cent. in flour there was an increase of 3½ per cent. in grain and 11 per cent. in provisions. This is what was to be looked for after the close of navigation and the cessation of shipments at the old rates. The distribution of the shipments among the several roads was also more nearly normal last week than the year before, the Chicago & Atlantic carrying three times as much and the Chicago & Grand Trunk a quarter less. The three Vanderbilt roads together carried 42.7 per cent. of the whole; the two Pennsylvania roads, 28.3, against 41.7 and 31.9 the week before. The Baltimore & Ohio carried a larger share last week than before for six months.

The two Pennsylvania roads carried 41 per cent. of the provisions, about equally divided between them (the Chicago, St. Louis & Pittsburgh 2,399 tons, the Fort Wayne 2,360), while the Chicago & Grand Trunk took 14⅝ per cent., the Nickel Plate 14¼ (unusually large for it), and the Lake Shore 14 per cent. The Chicago & Grand Trunk ranked second in grain shipments, which is very unusual, especially when exports are very light, as they now are; it took 13 per cent. of the grain, the Lake Shore very nearly as much, and the Michigan Central 24⅜ per cent.

The Fort Wayne carried 27½ per cent. of the flour; no other road more than 18⅛ per cent.

The movement is not large, but neither is it small, and in view of the small grain exports it is perhaps as large as could be expected. The new corn is beginning to come forward, but it will be felt first south of Chicago, at St. Louis and interior small places of shipment which do not report, and it may not be felt as much in shipments to the east as in receipts from the west, though so far it has been shipped about as fast as it was received.

There is reason for anxiety, because nothing has been done so far toward pooling the east-bound traffic at Chicago and other Western traffic centres. The general testimony is that rates have been strictly maintained so far; but the usual experience has been that rates are well maintained after the close of navigation for a few weeks, but that trouble begins after the holidays, and that in January demoralization becomes general, and rates grow lower and lower, rendering the bulk of the winter's business unprofitable. The arrangements for preventing this should be made before trouble begins, and the time when it usually begins is close at hand.

The tendency to send grain to market in the West seems to have increased just at the close of navigation, the receipts of the eight Northwestern markets for the week ending Dec. 5 having been greater than for six weeks previous, and exceeded in but three weeks of this year, which is just the contrary of what might have been expected. The shipments of these markets did not increase meanwhile, and the excess of receipts over shipments in the week to Dec. 5 was 3,832,584 bushels, which is very much more than in any previous week of the season. The excess of receipts was 2,551,000 bushels the week before, but in no previous week since harvest was it as much as 2,000,000 bushels.

The course of the total grain receipts for five weeks has been as follows, in bushels:

Week ending				
Nov. 7.	Nov. 14.	Nov. 21.	Nov. 28.	Dec 5
4,694,883	4,465.068	4,895.272	6,107,443	6,750,703

The large receipts at this time are due chiefly to corn, for the wheat receipts for these five weeks have been, successively:

1,700,861	1,664,965	1.484,919	1,838,526	2.115 713

so that of the increase in total receipts of 2,056,000 bushels since the first week of November only 415,060 is wheat, and the corn receipts have been:

1,035,539	926,705	1,642.768	2,375,916	2,702,937

so that the increase in this grain since the first week of November has been 1,667,000, which is five-sixths of the total increase.

This is encouraging to the carriers east of Chicago, because the corn has so far gone to market promptly, while the wheat has remained in Western elevators as if waiting for navigation to open in the spring; and it is encouraging to all the carriers, because this is but the beginning of the movement of the new crop of corn, while it is near the close of the wheat crop movement. The corn receipts, moreover, are larger than ever before at this season, though they began to be large at this time last year, while the wheat receipts were nearly one-third less than in the corresponding week of last year (when they were extraordinarily large for the first three weeks of December). The corn receipts for the week to Dec. 5 in successive years have been :

Year.	Bushels.	Year.	Bushels.
1877	840,133	1882	2,309,625
1878	1,141,573	1883	1,777,374
1879	1,82 ,241	18 4	2,396,920
1880	2,234,0 6	1885	2,702,537
1881	1,618,135		

Last year the corn receipts averaged but 1,461,000 bushels a week for three weeks after this week to Dec. 4, but for the next three months they were very large, as, indeed, they have been for three years past, though in two of these years the crop was very light. We may surmise, therefore, that the demoralized railroad rates to the East, coupled with the exhaustion of the supplies of old corn, had not a little to do with the heavy winter movement. So far as the stocks on hand at the great distributing markets are concerned, they are as small this year as after the poorest crops; but it is to be hoped that we shall not have this year the very low rates which have helped to bring out great quantities of corn in each of the past three winters. Whether it will come without that inducement remains to be seen. It must come as fast as it is consumed, and that ought to be satisfactory to the railroads, even if there is a great deal left for the vessels to take next May. The large crop should give both a great deal to carry.

The wheat receipts at Duluth increased still further in the week to Dec. 5, being then 1,014,000 bushels, which is more than ever before in the history of the market. Naturally, its largest receipts are in September or October, or at some time long enough before the close of navigation to permit the shipment of the grain; as wheat that goes there at this season must go there to be stored till spring. This is particularly true in the present case, for it is understood that most of the grain received at Duluth recently has come from Minneapolis and St. Paul, where the stock in the elevators is 7,700,000 bushels.

The receipts of wheat are now so nearly exclusively at the spring wheat markets that we are led to believe that but little winter wheat is left to come forward. In this week to Dec. 5 the three winter-wheat markets, St. Louis, Toledo and Detroit, received but 316,673 bushels; while the three spring-wheat markets, Chicago, Milwaukee and Duluth, received 1,785,140 bushels. If the surplus of winter wheat in farmers' hands is exhausted, then wheat receipts cannot long continue at the present rate, for the spring wheat production is a very moderate quantity, and a considerable quantity has already come to market. About 17,900,000 bushels of wheat have been received at Chicago, Milwaukee and Duluth since August, and though a small part of the Chicago receipts has been winter wheat, this doubtless has been less than its receipts of spring wheat (chiefly from Nebraska and Iowa) in August. Besides this, is the enormous amount ground at Minneapolis and elsewhere, and 7,700,000 bushels now in store at Minneapolis and St. Paul. The quantity ground and marketed at Chicago and Milwaukee has been as much as 10,000,000, and a very large amount is distributed throughout the West and South that does not go to these markets. Usually, most of the wheat has reached the Western markets as early as January, and there seems no reason to believe that more than usual will be left behind this year. The total wheat receipts for the crop-year ending with July, the receipts for the first five months of this crop-year, ending with December, and for the last seven months of it, ending with July, have been, in bushels :

	1884-85.	1883-84.	1882-83.	1881-82.
Year to July 31	101,738,460	70,653,387	75.006,550	50,349,235
Five months to Dec. 31	72,579.395	51.763,197	51,817,672	26.134,747
Seven months to July 31	29,159,065	18,950 190	23.188,878	24,216,488
P. c. in last 7 mos.	28.7	26.8	3. 9	48.1

Thus there have never been large receipts at the Northwestern markets after December in any of these years, the largest weekly average being 972,000 bushels, last year. A large proportion of the year's receipts was forwarded in 1881-82, but then the year's receipts were very small, and the weekly average for the seven months after December was but 807.216 bushels.

As the stocks at Northwestern markets are very large (27,200,000 bushels Dec. 5) there may be large shipments from these markets after this month, but probably not large receipts at them.

The Canadian Pacific has established as its winter rate on wheat from Winnipeg to Montreal, 1,425 miles, 50 cents per 100 lbs., the distance being one-half greater than from Chicago to New York, over which the winter rate is now 25 cents per 100. The Winnipeg-Montreal rate, however, is not properly comparable with the Chicago-New York rate, but rather with the rate from Omaha or Kansas City to New York, which is 42½ cents, which is also the rate from St. Paul. Montreal takes the Baltimore rate from Chicago—3 cents less than the Chicago rate—so the rate from St. Paul to Montreal is 39½ cents; and the 11½ cents more that is charged from Winnipeg is much less than our railroads charge from Dakota to St. Paul. Thus the Canadian Pacific has reduced considerably the rail rate from Manitoba to the seaboard, and in these early days of its existence, with a thinner traffic than most frontier roads, makes substantially trunk-line rates over the larger part of its road. In the nature of the case this is necessary, if the grain is to be marketed at all, and if, at current prices, wheat is to be grown in Manitoba. It must be remembered that before reaching Winnipeg the wheat has already paid the Canadian Pacific at a much higher rate for hauls of various lengths up to two or three hundred miles. From Winnipeg the rate is 0.70 cent per ton per mile, which leaves some profit when the road gets a dozen or so full train loads daily; but can hardly do more than pay part of the expenses of keeping the road open when there is no more business than at this time.

The report of the Illinois State Grain Inspector for the year ending with October last shows the number of car-loads of each kind of grain delivered at Chicago by each of the railroads from the West, as follows :

Roads.	Wheat.	Corn.	Oats.	Rye.	Barley.	Total, 1885.	Total, 1884.
C., B. & Q.	9,642	42.710	8,261	1.296	1 883	63,793	70.498
C. R. I. & P.	3,927	13,660	5 806	627	429	24.449	25 283
Chi. & Alton.	740	3.500	1.630	68	4	5.942	15,522
Ill. Central	2 521	8.142	5 683	387	518	17,251	16.990
C. & N. W.	14,958	22.238	8.496	526	5,154	51.372	33 851
Wabash	2,332	5,563	1,621	98	123	9 738	20,782
Chi. & E. Ill.	992	1.583	1,603	53	20	3,651	2.788
C. M. & St. P.	13,711	4,435	7,846	367	4,816	31,187	19,657
Spec'l track.	3 474	460	792	91	51	4.887	5,442
Total	52,297	102.291	41,138	3,513	12,998	212,270	210,822

The total number of car-loads brought to Chicago by these roads was thus 1 per cent. more in 1885 than in 1884. The Northwestern gained 53 per cent., the Milwaukee & St. Paul 58½ per cent., the Illinois Central 1½ per cent.; but the Wabash lost 55 per cent., the Chicago & Alton 62 per cent., the Burlington 9½ per cent., and other roads smaller percentages. Of the total receipts 30 per cent. came by the Burlington this year, against 33⅛ per cent. last year; next comes the Northwestern, with 24¼ per cent. this year and 16 last; the St. Paul, with 14⅜ per cent. against 9⅛, and the Rock Island, with 11½ per cent. against 12. These four roads brought 80 per cent. of the whole this year, but only 70⅜ last year. The Wabash brought 9¼ per cent. of the whole last year, but only 4½ per cent. this year; and the Chicago & Alton's share fell from 7⅜ to 2¾ per cent.

These figures do not represent what the railroads call their Chicago grain business, as they exclude the cars turned over to Eastern railroads at junctions outside of Chicago, and nearly all the grain billed through to the East by rail that some of them bring is transferred at these outside junctions. Thus when the trunk line rates are very low, so that few shipments are made by lake, the receipts reported by the State Inspector for some of the roads are likely to be small. The roads with such junctions are the more southerly lines, particularly the Rock Island, the Chicago & Alton (at Joliet), the Wabash and the Illinois Central. The Northwestern and the St. Paul have no such junctions with Eastern lines

---

The effect of the cheapening of transportation in this country and from it is shown in the area of the different crops in Great Britain. The cheap transportation tends to equalize the value of land there and here, and to make especially unprofitable there those products which do not suffer from transportation, especially grain, and above all the heavy grains. The result has been that in 1885 in Great Britain the acreage of wheat and barley was one-sixth less than in 1879, while there was an increase of 7 per cent. in oats. There was also a small decrease of the root crops, which are so important there, and the whole area of plow land decreased from 23,040,915 acres to 22,279,699, or 3.3 per cent., while the permanent pastures increased from 24,395,905 to 25,616,071 acres, or 5 per cent., and there was an increase of 9 per cent. in the number of cattle, and 16 per cent. in hogs, and a decrease of 2⅛ per cent in horses and 6¾ per cent. in sheep.

Statistics of cotton production collected by *Bradstreet's* (reports coming from 1,246 correspondents in 651 of the 660 counties having more than 500 acres of cotton) indicate that the crop of 1885 is 6,474,000 bales, while for six years previous it has been :

1879	1880.	1881.	1882.	1883.	1884.
5,757 397	6 589,329	5,436 845	6,992,234	5,713,000	5,699,021

This makes this year's crop 13½ per cent. more than last year or the year before, larger than in any other except 1882, and but 7.4 per cent. less than then.

This being so—and all accounts agree that there is a large increase over the crop of 1884—it is remarkable that the crop movement has been very nearly the same as last year

and the year before, and indeed not much different from those of other years, the seaboard receipts down to Dec. 12 having been, in bales:

1880.	1881.	1882.	1883.	1884.	1885.
3,019,684	2,825,634	2,951,369	2,966,931	3,071,208	2,916,219

Thus the receipts this year from a crop of 6,474,000 bales have been 155,000 bales (5 per cent.) less than last year from a crop of 5,699,000 bales, and less than in any other year of the six except 1881. A corollary is that an unusually large amount of cotton remains to be carried hereafter.

For the first full month of the winter packing season, the number of hogs packed in the Northwest was 2,052,732 this year, against 1,451,955 last year, an increase of 600,777, or 41.4 per cent.—truly an enormous gain. Packing increased largely last year after November, and it is almost certain that this rate of increase will not continue; but it is altogether probable that there will be a large increase over last year for the whole season.

The Chicago, Burlington & Quincy's increase in earnings in October was wholly in freight, and the freight earnings were exceptionally large, the gain over September being $302,200, or nearly one-sixth. There is not usually a great difference in the freight earnings of the two months. The passenger earnings in October were a little less than last year, and a great deal (9 per cent.) less than in September of this year, when they were extraordinarily large. They were 4 per cent. more than in October, 1883, and have been exceeded only in October of last year and September of this year and 1883. The miscellaneous earnings, which had increased enormously since 1883, last October were 31 per cent. less than last year and even 8 per cent. less than in 1883. The changes in the different sources of traffic are shown below for the ten months ending with October:

	1885.	1884.	1883.
Passenger	$4,415,958	$4,570,452	$4,529,275
Freight	16,166,660	15,308,551	15,926,354
Other	1,326,380	1,310,419	1,021,047
Total	$21,908,398	$21,189,422	$21,476,676

The totals have not changed greatly, being this year 3.4 per cent. more than last year and 2 per cent. more than the year before; but it is noticeable that of the increase of $434,000 over 1883 no less than $305,000 was in miscellaneous earnings (30 per cent.), while the increase in freight earnings meanwhile was but 1½ per cent., and there was a decrease of 2½ per cent. in passenger earnings.

The crowds of Christmas shoppers who vainly seek transportation in the street cars, and the constant and annoying blockades caused by the efforts of the companies to provide additional facilities, have again created a demand in Boston for some means of more rapid transit, and there is a cry for elevated railroads. This year it seems to be taking more practical form than it did last year, and a number of gentlemen of character and influence, including ex-Congressman Candler, ex-Mayor Prince, Mr. Wadleigh, formerly Senator from New Hampshire, and others, propose to petition for a charter to build an elevated railroad, with lines from the city proper to Cambridge, to Brookline and to West Roxbury Park, and a belt line connecting all the passenger stations of the railroads terminating in the city; the motive power to be electricity. It will probably be no easy matter to obtain a charter in face of the opposition of the street railroad companies, but it will be more difficult to secure the requisite capital and a location on the streets of the city. So the prospect of an early solution of the problem of rapid transit in Boston by this means is not very flattering. Meanwhile the Meigs project is approaching the stage of practical experiment on half a mile of track. The structure is well advanced, and an engine and car are nearly completed. It is said that some engineers, who have heretofore been skeptical as to the success of the plan, after recent examinations of the engine, have been much less confident that it will prove a failure. Mr. Meigs is as sanguine as ever, and in the course of the winter expects to satisfy the public by successful experiment on his half mile of track.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines is given in the current number of the *Railroad Gazette* as follows:

Asheville & Spartanburg.—Track laid from Hendersonville, N. C., northward 7 miles, completing the road.

Chicago & Northwestern.—The *Northern Illinois Branch* is extended from Troy Grove, Ill., southward to Spring Valley, 13 miles.

Passaic & New York.—Track laid from Passaic, N. J., north by east to a connection with the New York, Susquehanna & Western road, 4 miles.

Rome & Carrollton.—Extended southward to Cedartown, Ga., 12 miles.

St Louis & Emporia.—Extended from Pleasanton, Kan. east to Foster, Mo., 16 miles.

Western North Carolina.—Extended from Nantahala, N. C., southward to Jarrett, 8 miles.

This is a total of 60 miles on 6 lines, making 2,699 miles thus far reported for the current year. The new track reported to the corresponding date for 14 years has been:

	Miles		Miles.
1885	2,699	1878	2,263
1884	3,652	1877	1,994
1883	5,997	1876	2,278
1882	9,799	1875	1,333
1881	7,808	1874	1,844
1880	5,997	1873	3,630
1879	3,643	1872	7,160

These figures include *main track only*, second tracks and sidings not being counted.

NEW PUBLICATIONS.

Baldwin's Official Railroad Guide, which has been published for several years as a guide to the railroad lines of Western New York, the oil regions of Pennsylvania and Ohio, in fact of the railroad system tributary to Buffalo, has been sold to Matthews, Northrup & Co., of Buffalo, the well-known publishers, who have done so much railroad work. The January issue will be printed and published by Messrs. Matthews, Northrup & Co. at their Art Printing Works in Buffalo. They will be hereafter the sole proprietors, and intend to add new features which will increase the usefulness and attractiveness of the *Guide*.

TECHNICAL.

Locomotive Building.

The Cooke Locomotive Works in Paterson, N. J., last week shipped several new locomotives to the Minnesota & Northwestern road.

The Pittsburgh Locomotive Works in Allegheny, Pa., are building a new foundry, the present one being too small to meet the demands on it. The new building will be 80 by 300 ft., and will be of stone, brick and iron.

The Car Shops.

The Chicago, Burlington & Quincy is having a suburban train equipped with the Westinghouse atmospheric train signal.

The St. Louis Car Wheel Co. reports an increase of orders, and the works are now more actively employed than for some time past.

The Barney & Smith Manufacturing Co. in Dayton, O., last week delivered to the Wisconsin Central road three milk cars and ten passenger cars. Seven of the passenger cars are first-class and three are second-class. They are finished in cherry, decorated in old gold tints, provided with convenient wash and toilet rooms and supplied with all modern conveniences, including the latest improved links and wheels, bound with steel tires. The same shops are building several more passenger and sleeping cars for the Wisconsin Central line between Chicago and St. Paul.

Iron and Steel.

The Laclede Rolling Mills in St. Louis started up last week after a stoppage of over a year. They will run chiefly on boiler plate and sheet iron for the present.

Katahdin Furnace at Katahdin, Me., went into blast Dec. 1, and is working well.

The Lochiel Rolling Mill at Harrisburg, Pa., started up Dec. 10 with a small force, which will be increased as fast as the plant can be put in proper order.

Lanesboro Furnace at Lanesboro, Mass., has been sold to English capitalists, who intend to put it in blast.

Chatham Furnace at Chatham, N. Y., is in blast and is making 114 tons of car wheel iron per week.

The production of the Pennsylvania Steel Works for the month of November was very large, and several of the departments made records in excess of any previous month in the history of the company. The open hearth furnaces are in splendid working condition and their production for the month of November was the largest ever made. The new rail loading machines are doing good work. It pulls the rails from the bed to the car with great ease.—*Steelton (Pa.) Reporter.*

Mollie Furnace at Shawnee, O., has gone into blast this week.

Manufacturing and Business.

The Palmer Torpedo Signal Co. (whose signal was illustrated in our number for Nov. 20 last, page 739) has just sold 17 of its machines to the Manhattan Elevated Railroad Co., of New York.

Messrs. Barrows & Co., No. 64 Broadway, New York, have placed orders for 4,500 tons of 60-lb. steel rails with the Cleveland Rolling Mills, five 40-ton locomotives with a leading manufacturer, also frogs, switches, coal cars, etc. The fastenings were placed by them in Pittsburgh. All the above are to be used in constructing 50 miles of the St. Louis & Chicago Railroad, now under way.

Messrs. Blackmer & Post, of St. Louis, manufacturers of culvert and drain pipe, have in contemplation the building, at Belleville, Ill., of new and extensive works.

The Rail Market.

Steel Rails.—Sales have not been large, but quotations continue firm at $34@$35 per ton at mill. The *Bulletin* of the American Iron and Steel Association says: "A gratifying indication of the improvement of business in this country is found in the fact that the steel rail companies, which, it will be remembered, made a compact at Long Branch last summer to limit their output to what then seemed likely to equal the wants of the railroads for 1886, have already, before the beginning of the year, so nearly sold the whole of that estimated total that they have now increased the stipulated output by 255,000 tons, making the present limit for 1886 1,000,000 tons. Indeed, a number of manufacturers had already sold up to or beyond their allotments for the entire year before this action was taken, being unwilling that any appearance of unreadiness or inability to meet any legitimate demand should exist. There is, therefore, not the least reason to fear that any buyer of rails who can satisfy the railmaker of his ability to pay for his purchases will be unable to supply his wants at prices unaffected by artificial restrictions."

Rail Fastenings.—Quotations continue steady at 2.10 cents per pound for spikes in Pittsburgh, 2.40@2.80 for track-bolts, and 1.65@1.75 for splice-bars. An improved demand is reported.

Old Rails.—Old iron rails are scarce and are firmly held, quotations being $19@$20 per ton at tidewater. Old steel rails are quoted at $19@$20 per ton in Pittsburgh.

Western Society of Engineers.

The 219th meeting was held in Chicago Dec. 1. Mr. Comstock was called to the chair, and Mr. Herr was appointed Secretary *pro tem.*

The Committee on Civil Works under the United States Government presented circular letters from the Engineers' Club, of Cleveland, Ohio, and St. Louis, Mo., in reference to the Convention of Delegates to be held at Cleveland, Ohio, on the 3d, 4th and 5th inst. for consideration of the subject. The Committee also reported that Prof. L. E. Cooley will represent this Society in the Convention.

A paper by Mr. C. H. Hudson, of Knoxville, Tenn., on Descriptive Experiments to Determine Frictional Resistance of Railway Trains was read by the Secretary.

The Society then adjourned.

Engineers' Club of Philadelphia.

A regular meeting was held in Philadelphia Nov. 21, Past President Rudolph Hering in the chair; 60 members and 4 visitors present.

The Secretary presented, for Mr. W. S. Church, a large number of photographs, tracing, pamphlets, and other documents, illustrating the design and progress of the New Croton Aqueduct, and read two communications from Mr. Church.

Mr. John S. Elliot presented a paper on Specifications as Affecting the Dimensions of Iron Railroad Bridges.

A discussion followed upon the paper of Mr. James Christie upon the adapation of Steel to Structural Work. Mr. Christie, Mr. Cleeman and Prof. Burr taking part.

Mr. George S. Strong presented an illustrated description of Rack Rail Appliances for railroads with very heavy grades. Mr. J. Foster Crowell presented an illustrated paper upon Masonry Arches, treating mathematically the determination of dimensions of voussoirs in difficult cases, and giving the result of his experience as to methods of withdrawing centres.

Mr. A. R. Roberts exhibited an appliance for Fastening the Floor Timbers of Highway Bridges to the iron I-beams of the floor system. It consists of a piece of flat wrought iron cut from the ends toward the middle, the divided portions being bent at right angles to the piece so that one opposite pair, after being ragged, can be driven in the wood, and the other pair bent under the flange of the iron beam.

Mr. Henry G. Morris introduced Mr. P. Oestburg, who exhibited specimens of and described the Mitis Metal Castings, which are made from wrought iron and have a very high ductility.

Mr. Wm. H. Dechant presented a description of a movable Dam and Caisson Operating truck, illustrated by a small model and photo-lithograph plates. He claims a number of advantages in the system over the French or Chanoine system of movable dam, constructed by the U. S. Government at Davis' Island, below Pittsburgh. The system also applies to flush strips on top of permanent dams; and they are in practical use on several of the dams on the Schuykill Navigation; where the flush strips from 10 to 18 in. in height are used, they are operated directly by a man walking out along the comb of the dam, one man being able to raise or lower such a wicket 10 ft. long with ease.

The Secretary announced the death of a member, Mr. Dwight Edward Pierce, and Mr. M. W. Rudderow presented a narrative of his experience and achievements, as a Memorial for publication in the *Proceedings*.

Electric Head-Lights.

The Indianapolis *News* says: "The Pan-Handle and the Big Four have taken the electric headlights from their engines. The trial proved satisfactory, but the cost of the light was too great to be assumed in these days of small earnings. The cost to the Big Four, for illustration, if it should have equipped its 79 engines with electric lights, would have been enough to absorb the dividend which was recently declared. The light may be put in an engine for about $400, which would amount to $31,600 first cost for the 79 machines. An engineer who rode behind the light on the Pan-Handle, said that the reflection was so brilliant that pale signal lights were eclipsed. Otherwise the electricity is every way a desirable thing, if the cost be not excessive."

The Eames Vacuum Brake for Freight Trains.

The exclusive right to sell and lease the Eames vacuum brake for use on freight trains in North America has been sold to a new corporation known as the Standard Equipment Co., of New York, which is now prepared to contract for the equipment of freight trains at moderate rates.

The Standard Equipment Co. is controlled by Messrs. Wm. Windom, of Minnesota; Thomas L. James, of New York; Wm. H. Barnum and Morris W. Seymour, of Connecticut. Mr. George B. Hibbard is General Manager of the company, and has his office at No. 32 Nassau street, New York.

A trial of the Eames non-automatic vacuum freight brake was made on the Housatonic Railroad lately. The train with which the trials were made consisted of 20 empty freight cars and a caboose fitted with the brake. The train being short and having little slack, presented conditions favorable to a quick stop, but the chances of sliding the wheels were increased by the fact that the cars were empty. No wheels were, however, slid during the trial.

From the movement of the ejector lever to the beginning of the application of the brake upon the rear car was *two seconds.*

From the movement of the ejector until the complete application of brake upon last car *six seconds.*

With a speed of 30 miles an hour, on a down grade of 50 ft. to the mile, the train, which was 710 ft. in length, was stopped by the use of the car brakes alone, without engine driver brake, in 1,400 ft.

At a speed of 32 miles an hour, using the car brake and driver brake, the train was stopped in two cars less than its length, or 646 ft.

Blast Furnaces of the United States.

The *Iron Age* says: "We publish this week the usual statement, showing by districts and fuel used the number of blast furnaces in the United States in and out of blast Dec. 1, 1885, together with their weekly capacity. Continuing the change made last month in our method of reporting, we give this statement for all furnaces, charcoal as well as anthracite and bituminous. Four furnaces only are missing from the report, all charcoal, one each from Minnesota, Texas, Utah and Oregon. These are of so little moment that the report may be regarded as complete.

"In a condensed form the table makes the following showing as to the condition of the furnaces Dec. 1, 1885:

	In blast.		Out of blast.	
Fuel.	No.	Weekly capacity.	No.	Weekly capacity.
Charcoal	61	8,360	163	15,582
Anthracite	94	26,816	128	28,438
Bituminous	99	49,790	122	44,917
Total	254	84,966	413	88,937

"This showed a marked change since last month; 21 more furnaces are in blast on Dec. 1 than there were on Nov. 1; three more charcoal, with about the same weekly capacity as a month ago; eight more anthracite, with 2,600 tons more weekly capacity, and 10 more bituminous, with 5,700 tons more product weekly. This makes an indicated increased output of some 8,300 tons a week of anthracite and bituminous iron since Nov. 1, and the statements of furnaces blowing in or about to blow indicate that this will be very much increased by Jan. 1. The increase in anthracite furnaces has been chiefly in New York and the Lehigh Valley. In bituminous it is quite general, many districts showing a slight increase.

"The number of anthracite and bituminous furnaces in blast at the beginning of each month of the present year together with their weekly capacity, is as follows:

	Anthracite.		Bituminous.	
1885.	No. in blast.	Capacity per week.	No. in blast.	Capacity per week.
January 1	86	21,564	82	36,812
February 1	81	21,189	87	46,653
March 1	86	22,889	91	46,774
April 1	82	21,704	90	45,655
May 1	80	20,729	95	43,397
June 1	79	19,834	94	44,498
July 1	81	20,444	92	43,945
August 1	77	20,530	86	44,845
September 1	78	20,190	88	42,663
October 1	75	20,318	88	43,234
November 1	86	24,270	89	44,101
December 1	94	26,816	99	49,790

"A year ago 88 anthracite furnaces were in blast, with a weekly capacity of 22,963 tons, and 93 bituminous furnaces, with 43,834 tons capacity—that is, more furnaces are in blast this year, with a largely increased weekly make. On Nov. 1, 1885, the stocks of pig iron, though more furnaces with a greater capacity were in blast, were somewhat less than a year ago. The stocks Dec. 1, with still more furnaces and capacity, are less than a month ago, and many furnaces are ahead, especially those making Bessemer pig, a condition that was not known a year since."

A Remarkable Fact Developed in Telegraphing To and From Moving Trains.

The Phelps Induction Telegraph Co. states that it can equip a railroad with its system at an expense of $50 per mile or less, as against $300 per mile according to the previous estimates. The reason for this remarkable reduction in price, as explained by Mr. Phelps, is as follows:

"When we equipped the Harlem River Branch of the New Haven Railroad, about a year ago, we used the very best wire, which cost $150 per mile, and protected it in a wooden box that cost $100 per mile, and the labor amounted to $50 per mile. We were surprised to find how easily we could maintain communication with the moving train; how little battery was necessary, ten Bunsen cells being sufficient at the terminal station and two cells on the car.

"A series of experiments showed finally that we could still hear signals, though so much of the current passed through a shunt that, according to the law of the division of currents, in transmitting from the station to the train only .0001 part of the current generated by the battery passed over the line, the other .9999 parts going through the shunt, and in the transmission from the car of the current induced on the line, only one seven-thousandth part passed through the receiver. These experiments demonstrated conclusively that insulation is not a very important matter in the working of our system, and we propose now to use only an ordinary telegraph wire, supported by insulators upon the ties about three inches outside and just below the surface of the rail. The insulators will be about 25 ft. apart and of a special design. The coil upon the car will be outside the wheels, passing forward on one side of the car and back on the other, so that either side of the car may be turned to the wire. In this manner a railroad can be equipped with our system as cheaply as an extra wire can be put upon poles that are already standing, and if poles are to be erected, as in case of a new road, it can be equipped with our system at half the cost of a pole line."—*Electrical World.*

A New Electric Street Railroad.

An electric street railroad is nearly completed in South Bend, Ind., built on the Van Depoele system. The current is led to the cars by an overhead wire upon which a traveler runs, and, as there is only a single wire, special arrangements are provided to allow the travelers moving in opposite directions to pass one another. The energy is obtained from two large Van Depoele dynamos, both fields of which are excited by a single exciting dynamo. The machines are run by water-power. The tracks constitute the return circuit, and to make a good circuit strips of brass are laid under the joints of the rails. The speed of car is under full control by means of switches, and the road will soon be in regular operation.

THE SCRAP HEAP.

Too Fast for Him.

"There are some odd people you can't understand, but their oddities are still more incomprehensible," observed a railroad employé of a line entering Keokuk. "An old man who boarded the train the other day has a remarkable peculiarity. He is an inveterate chewer of tobacco. He got on at Canton, Mo., having purchased a round-trip ticket to La Grange. Taking a seat in the smoker, he rammed half a plug in his fly-catcher, but we got to La Grange before the old man got the quid in good condition for successful expectoration. 'By gosh,' he said as he dismounted, 'I'll be derned if I travel on a train that travels so fast a man hasn't time to spit tobacco juice.' He kept his word, and although he had a round-trip ticket, sode back to Canton on a lumber wagon so that he could spit while traveling. This is odd, but it is no fiction."—*Keokuk (Ia.) Gate City.*

Railroad Young Men's Christian Association.

The association at Port Henry, N. Y., reports for November 13 religious meetings with a total attendance of 270. There were 105 business calls made, 4 visits to sick or injured persons, and 75 papers distributed. Two lectures were delivered before the Association. The *Bulletin* issued in the interest of the Association now prints 1,000 copies monthly.

Grading Employes.

The Delaware & Hudson Canal Co. has issued an order stating that each employé on its railroad lines will be furnished with a blank containing questions concerning his time of service on the road, his record as to accidents, whether or not he was ever discharged, and other questions. This blank will be filled out by the employé and returned to the headquarters. The men will then be graded according to time of service and record, the older men being given the preference, and due consideration being given to the record in other respects.

A Fatal Accident.

A very fatal accident occurred at midnight of Dec. 14, near Austell, Ga., on the track used in common by the Georgia Pacific and the East Tennessee, Virginia & Georgia roads. A Georgia Pacific mixed train had stopped for water, leaving the passenger cars at the rear of the train standing on a trestle, when an East Tennessee passenger train ran into it, completely wrecking the rear car, killing 10 persons, injuring 6 mortally and 4 others very severely. Most of those killed and injured were scalded by steam from the locomotive. The accident seems to have been due to the absence of proper signals.

Pathfinders.

"Yes, sir," remarked the colporteur, seating himself down beside the commercial traveler, "Yes, sir; whiskey causes the most murders, but selling clothing creates the most lies." And the traveler was so glad he was in white goods that he forgot to pay his fare.

What made the young man on the bicycle mad was not merely that the train ran over him at the crossing and chopped up one of his legs, but that the local paper spoke of the fragments as "veal cutlets." Then when he demanded a retraction, it apologized and called them "pork chops."

"All maps," remarked the train-boy, "get old because the country is growing." "Yes," replied the weary traveler, "that is one reason. The other is because there is so much more profit in just printing them from the old plates." The news agent said thoughtfully that he had never thought of that. But then he lied.

"Conductor," said the determined-looking passenger, showing up a ten-days' excursion ticket four years old, "here is my ticket and it's good till it's used, and I know it, and so do you." "Right you are," pleasantly replied the good conductor, punching a small colony of holes all over the pasteboard, "and it has been ab-used, dis-used, and ref-used, and I know it and so do you. Two dollars and forty cents, please." And he felt so good he forgot to hand the resolute passenger his rebate check.

Bill Drawbar is the kindest hearted man that ever twisted a brake; he wouldn't hurt a kitten. Nevertheless, he scared poor old Mrs. Lone, the widow, so bad that she had nervous hysteria for two weeks, and then married Deacon Fourscore because she was afraid to sleep alone. You see, Bill was making up second 73, and just as Mrs. Lone started to cross the tracks at the upper end of the yard, Bill yelled to the other brakeman, "Jump on her, Ben! Jump on her as she comes down, cut her in two and run her down the siding behind the elevator! Now then, catch her!" And then the poor old woman gave one feeble little screech for mercy, and fainted dead away; and poor Bill can't imagine what "scart her."—*Burdette, in Pathfinder Guide for December.*

The Man Who Wants to Find Out.

When the train comes to a stop on a siding between two stations, something has got to be done. The veteran railroad traveler either pulls out a newspaper or settles down for a cat-nap, and the responsibility of finding why the train is standing here instead of thundering along 20 miles away devolves upon Farmer Davis. Mr. Davis got on two stations below, and is going three stations beyond. He was at the depot just an hour and a half before train time, and he spent the long interval in reading railroad advertisements and walking up and down the platform. He didn't ask the station master if the train was on time over 20 times, which was letting him down very easy.

Now that the train has come to a standstill without just cause or provocation, something should be done. Indeed, something shall be done, and Mr. Davis is the man to do it. He throws up his window, crawls out as far as he can, and looks up and down the train. He sees nothing to alarm, and nothing to indicate the cause of delay.

"Mighty singular, isn't it?" he queries of the man behind him as he draws in his head.

"Yes."

"Ever know a train to stop this way before?"

"Never."

"Some one ought to find out the cause of it, hadn't they?"

"Some one certainly had."

"Well, I'll go out and look around a little. If they've come to a stop a-purpose to let some other train run into us I want to know it."

The farmer goes out and walks down to the rear of the train, but nothing is in sight. Then he heads about for the locomotive. When he reaches it, he finds the fireman oiling up and the engineer smoking. He can't see that there is a single wheel missing—not a one. The cow-catcher is in its accustomed position—smokestack, cab and tender are seemingly all right, and Farmer Davis begins to feel indignant.

"What's the matter?" he demands as he looks the engineer square in the eye.

The engineer looks down upon him as calm and placid as a June morning, but has no reply.

"Anything give out?"

No reply.

The fireman is next appealed to, but if Mr. Davis was ten thousand miles away that fireman could not have been more oblivious of his existence.

"Now you look a-here!" says the farmer, as he advances a foot nearer. "I want to know why in Tophet this 'ere train is fooling around here alongside of this swamp instead of tending to bizness? Mebbe you've got time to fool away, but I haven't!"

Neither the engineer nor fireman even looked at him. He thought of climbing into the cab and waking them up, but gave up the idea on second thought, and returned to his seat in the car. Just as he reached it the Chicago express came rushing past, and in half a minute his own train moved on.

"Why, they must a-been waiting for that train!" he said to the man behind him.

"Oh, certainly."

"And you knew it all the time?"

"Of course.

"Then, sir, I want to say that you are a pizen-mean man not to tell me of it, and I wouldn't sell you taters if you offered $4 per bushel!"—*Detroit Free Press.*

Relics of the Old Erie.

Two relics of the old New York & Erie Railroad have been discovered, framed and hung in the office of John N. Abbott, the General Passenger Agent of the Erie in New York. One is a map of the line when it extended from New York to Dunkirk only. There is no date on it, but it is thought to be over 30 years old. It was recently found posted on a board fence out beyond Denver, Col. It is in pretty good condition, considering its long exposure. A few pieces are gone from it, and there are many weather stains on it, but the railroad system from New England to the Mississippi River, as it then existed is clearly shown. The map is printed in two colors, black and red. It was the triumph of map-printing at that time, but looks crude alongside of the complete and elaborate maps issued by railroads nowadays. Its size is 18 by 36 in.

The other relic is a copy of time table No. 9 for the Western Division, which went into effect April 28, 1851. This was found by Superintendent R. B. Cable, of the Susquehanna Division, in a lot of old papers. It is 6 in. square, and is signed "Chas. Minot, Sup't." The Western Division extended from Hornellsville to Dunkirk. A freight train ran each way daily the entire distance, and a passenger train each way between Hornellsville and Cuba. Cuba is 51 miles from Hornellsville, while Dunkirk is 71 miles beyond. Pretty fair time was made by the passenger train, which ran from Hornellsville to Cuba in 2 hours and 35 minutes and returned in 2 hours and 15 minutes.

Not Injured.

The following conversation took place on Sunday morning of last week between the porter of a sleeping car and one of our most veracious subscribers, who has kindly reported the incident to us:

Passenger on Erie train loquitur: "Porter, was the Plato injured in that smash-up last week?"

"No, sah! de Plato didn't got injured, she got burned up."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Cleveland & Pittsburgh, annual meeting, at the office in Cleveland, O., Jan. 6.

Columbus, Hocking Valley & Toledo, annual meeting, at the office in Columbus, O., Jan. 12.

New York, New Haven & Hartford, annual meeting, in New Haven, Conn., Jan. 13.

Philadelphia & Reading, annual meeting, at Association Hall, in Philadelphia, Jan. 11, at noon.

Philadelphia, Wilmington & Baltimore, annual meeting, at the office in Wilmington, Del., Jan. 11.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Manhattan, 1½ per cent., quarterly, payable Jan. 2, to stockholders of record on Dec. 19.

Northern Central, 4 per cent., semi-annual, payable Jan. 15, to stockholders of record on Dec. 31.

Richmond & Petersburg, 2½ per cent., semi-annual, payable Jan. 1.

St. Paul & Duluth, 3½ per cent, semi-annual, on the preferred stock, payable Jan. 1, to stockholders of record on Dec. 19.

Railroad and Technical Conventions.

Meeting and conventions of railroad associations and technical societies will be held as follows:

The *Master Car-Builders' Association Committee on Freight Train Brakes* will hold a meeting and hearing at the Lochiel House, in Harrisburg, Pa., on Wednesday, Jan. 6, 1886.

The *American Society of Civil Engineers* will hold annual meeting at the Society's House, in New York, Wednesday, Jan. 20, 1886.

The *Master Car-Builders' Club* will hold its regular monthly meetings through the winter at the rooms, No. 113 Liberty street, New York, on the evening of the third Thursday in each month.

The *New England Railroad Club* will hold its monthly meetings at its rooms in the Boston & Albany passenger station in Boston, on the evening of the second Wednesday in each month.

The *Western Railway Club* will hold its regular monthly meetings at its rooms, No. 103 Adams street in Chicago, onthe third Wednesday in each month.

ELECTIONS AND APPOINTMENTS.

Atlantic & Pacific.—Mr. H. W. Gardner has been chosen Treasurer in place of C. S. Tuckerman, resigned, to date from Jan. 1 next. Mr. Gardner is now on the New York, West Shore & Buffalo road.

Burlington, LaFayette & Western.—This company has elected officers as follows: President, G. J. Henninger, La Fayette, Ind.; Secretary, Carl C. Winter, Danville, Illinois.

Centralia & Chester.—The directors of this new company are: R. J. Harmer, Wm. McAdams, James J. Morrison, Chester, Ill.; John C. Salter, Carbondale, Ill.; Thomas B. Needles, Nashville, Ill.; David B. Boyd, R. H. Roxborough, Sparta, Ill.; Samuel L. Dwight, L. M. Warner, Centralia, Ill.; Thomas M. Koues, W. T. Wylie, New York. Mr. S. L. Olmstead is Chief Engineer.

Central Iowa.—Mr. E. G. Player, who recently resigned his position as Master Mechanic, has been reappointed to that office. Headquarters at Marshalltown, Iowa.

Central Passenger Committee.—Mr. George H. Daniels, for some time past Commissioner of the Colorado-Utah Association, has been chosen Commissioner of this organization, and has accepted the office.

Chesapeake & Ohio and *Kentucky Central.*—The following circular from General Superintendent W. B. Ryder, is dated Richmond, Va., Dec. 14:

"In pursuance of authority, dated Dec. 10, 1885, I assume control of the Transportation, Mechanical, Maintenance of Way, and Telegraph departments; subordinates in Maintainance of Way Department to report to the Chief Engineer as heretofore.

"The following officers in charge of departments and divisions will report direct to this office: T. L. Chapman, Superintendent of Motive Power; M. B. Leonard, Superintendent of Telegraph; A. H. Wood, Superintendent of Eastern Division; E. H. Barnes, Superintendent of Huntington Division; J. D. Yarrington, Superintendent of Lexington Division; H. E. Huntington, Superintendent of Kentucky Central Division."

Chicago, Burlington & Quincy.—The following changes are announced, to take effect Jan. 1 next: Mr. W. D. Sanborn, at present Division Freight and Passenger Agent of the company at St. Louis, will after that date represent the company's Pacific coast interests at San Francisco. He will be succeeded by H. D. Mack, at present Commercial Agent of the company at Rock Island, who will continue his office at that point and be placed in charge also of the St. Louis Division from Rock Island to Brighton, Ill. Mr. J. M. Bechtel, at present General Agent of the company at Peoria, will be sent to St. Louis in charge of business at that point, with territory extending as far north as Brighton.

Cincinnati, Washington & Baltimore.—Mr. W. H. King has been appointed Assistant General Passenger Agent, with office in Cincinnati.

Cleveland & Marietta.—The United States Circuit Court has appointed Gen. A. T. Wykoff, of Columbus, O., Receiver, in place of Phineas P. Pease, removed.

Covington & Macon.—The officers of this company are: L. F. Livingston, President; J. A. Ansley, Secretary and Treasurer; B. W. Frobell, Chief Engineer. Office in Macon, Georgia.

Delaware & Hudson Canal Co.—Mr. C. F. Rettew has been appointed Master Mechanic of the Pennsylvania Division, with office in Carbondale, Pa., in place of S. H. Dotterer, deceased.

Duluth & Iron Range.—At the annual meeting in Duluth, Dec. 2, the following directors were chosen: I. P. Beck, Richard H. Lee, H. F. Thompson, Charlemagne Tower, Jr., A. H. Viele, Duluth, Minn.; George C. Stone, St. Paul, Minn.; Edward Breitung, Negaunee, Mich.; Samuel P. Ely, Cleveland, O.; Charlemagne Tower, Philadelphia. The Board re-elected Charlemagne Tower, Jr., President; Geo. C. Stone, Vice-President and Treasurer; I. P. Beck, Secretary; Richard H. Lee, General Manager.

Eastern.—At the annual meeting in Boston, Dec. 9, the following directors were chosen by the bondholders: John Cummings, Edward W. Hooper, George E. B. Jackson, Charles J. Merrill, Richard Olney, Jacob C. Rogers. Of these Messrs. Cummings, Hooper, Jackson and Merrill are new directors, replacing Frank Jones, S. C. Lawrence, George S. Morrison and Arthur Sewall, the election having resulted practically in the defeat of the old board. It is understood that the result is to be contested in the courts.

The stockholders made no election but adjourned over to Jan. 9 next, when they will choose the three directors who represent them in the board.

East Tennessee, Virginia & Georgia.—The following circular from W. H. Thomas, Superintendent of Motive Power, is dated Knoxville, Tenn., Dec. 14:

"Mr. C. F. Thomas is this day appointed Master Mechanic of the Georgia Division, headquarters Atlanta, Ga., vice W. A. Walden, resigned."

Fairmont, Morgantown & Pittsburgh.—At the annual meeting in Baltimore, Dec. 9, the old board was re-elected, with the addition of W. A. Hanway, of Baltimore. The

board re-elected Thomas M. King President. Mr. King is Second Vice-President of the Baltimore & Ohio.

Genesee Valley Terminal.—At the annual meeting in Rochester, N. Y., Dec. 10, the following directors were elected: G. Clinton Gardner, C. N. Clark, B. K. Jamison, E. W. Clark, I. N. Seligman, E. F. Winslow, A. N. Martin, C. H. Allen, Bryce Gray, E. L. Owens, B. C. Rumsey, P. P. Pratt, John Dougherty. All of the directors, with the exception of John Dougherty, are directors of the Buffalo, New York & Philadelphia road.

Gogebic & Lake Superior.—The directors of this new company are: A. E. Tyler, Ironwood, Mich.; J. E. Burton, C. T. French, J. A. Kennedy, G. S. Read, B. O. Reynolds, J. C. Reynolds, L. D. Sampson, Geneva, Wis.; M. J. Luther, Streator, Ill.; J. B. Stubbs, J. G. Sherman, Chicago.

Gulf, Colorado & Santa Fe.—Mr. J. M. Williams has been appointed Roadmaster. He has been connected with the road for some time.

Hartford & Connecticut Western.—At the annual meeting in Hartford, Dec. 15, the following directors were chosen: C. T. Hillyer, Milo Hunt, L. B. Merriman, Hartford, Conn.; Henry Gay, W. L. Gilbert, Winsted, Conn.; Frederick Miles, Chapinville, Conn.; Lyman S Dunning, East Canaan, Conn.; Milo B. Richardson, J. O. Phelps, Simsbury, Conn.; Wm. H. Barnum, Lime Rock, Conn.; A. H. Holley, Lakeville, Conn.; S. G. Dimmock, Thomas Connell, Rondout, N. Y. Messrs. Dimmock, Gay, Hunt and Richardson are new directors, replacing E. T. Butler, R. B. Carpenter, C. J. Cole and J. F. Jones.

Illinois Central.—Mr. E. T. Jeffery, for eight years past General Superintendent, has been appointed General Manager, to date from Dec. 15. The office is a new one on this road.

Kansas & Gulf Short Line.—Mr. James N. Garrison has been appointed Receiver of this road.

Knox & Lincoln.—The new board has elected John T. Berry, President; John G. Richardson, Clerk; F. H. Low, Treasurer; Charles A. Coombs, Superintendent.

Lehigh & Hudson River.—At the annual meeting in New York, Dec. 14, the following directors were chosen: Grinnell Burt, Edward W. Clark, Francis R. Cope, Joseph S. Harris, Garret A. Hobart, Edward Lewis, John S. Martin, Frederick A. Potts, M. Rockhill Potts, W. C. Sheldon, George W. Stanford, James B. Titman, Francis C. Yarnall. Messrs. Clark, Cope, Harris, Lewis, M. R. Potts and Yarnall are new directors, representing the Lehigh Coal & Navigation Co. The board elected Grinnell Burt, President; Joseph S. Harris, Vice-President; D. B. Halstead, Secretary; John Sayre, Treasurer.

Maine Central.—At the annual meeting in Portland, Me., Dec. 16, the following directors were chosen: Darius Alden, Nathaniel J. Bradlee, Wm. G. Davis, Francis W. Hill, Thomas W. Hyde, Frank Jones, Horatio N. Jose, Samuel C. Lawrence, George C. Lord, Amos Paul, James S. Ricker, Arthur Sewall, John Ware. The board re-elected Arthur Sewall President; Payson Tucker, General Manager.

Memphis & Charleston.—The new board has elected officers as follows: President, C. M. McGhee, Knoxville, Tenn.; Vice-President, C. S. Brice, New York; Secretary, L. M. Schnarr, New York: Treasurer, H. C. Wilton, Memphis, Tenn.

Minnesota & Northwestern.—Mr. John Daly has been appointed Car Accountant of this road. He has been for some time a clerk in the office of the General Car Accountant of the Chicago & Northwestern road.

New York, Lake Erie & Western.—Mr. S. R. Johnston has been appointed General Roadmaster of this road. He was formerly on the Baltimore & Ohio road.

New York, Pennsylvania & Ohio.—Mr. W. M. Clements has been chosen a director in place of Mr. Charles Paine, resigned.

Ohio & Mississippi.—The following circular from President and General Manager W. W. Peabody is dated Cincinnati, Dec. 12:

"Mr. C. C. F. Bent is appointed Superintendent. He will have charge of the Transportation, Maintenance of Way and Rolling Stock departments. The heads of these various departments will report to him. This appointment to take effect Dec. 15, 1885."

Mr. Bent was for a number of years on the Pittsburgh, Cincinnati & St. Louis road, and was for two years General Superintendent of the New York and New England. More recently he has been Superintendent of the Louisville, New Albany & Chicago road.

Ottawa, Waddington & New York.—The directors have elected C. F. Frothingham, President; Wm. Sutphen, Vice-President; T. Brown Alderson, Secretary and Treasurer.

Park Point.—The directors of this new Minnesota company are: P. S. Humphrey, Tonawanda, N. Y.; Wm. Shaw, Bay City, Mich.; F. P. Harrington, E. R. Jefferson, Edwin V. Monday, George R. Stuntz, S. F. White, Duluth, Minnesota.

Richmond & Allegheny.—At the annual meeting in Richmond, Dec. 15, the following directors were chosen: Allen Y. Stokes, Charles E. Wortham, Richmond, Va.; Wm. L. Scott, Erie, Pa.; Wm. H. Barnum, Lime Rock, Conn.; C. S. Brice, James T. Closson, Francis O. French, J. Lee Humfreville, John J. McCook, Angelo Myers, Samuel Shethar, John W. Simpson, Samuel Thomas, New York.

Richmond & Danville.—At the annual meeting in Richmond, Va., the following officers were elected: President, Col. A. S. Buford; directors, H. C. Fahnestock, George F. Baker, W. P. Clyde, John McAnerney, F. W. Huidekoper, Joseph Bryan, John G. Moore, George S. Scott, George I. Seney, John H. Inman, W. G. Oakman, H. B. Plant.

Rhode Island & Massachusetts.—This company, whose road is leased to the New York & New England, has re-elected the old officers.

St. Louis & Chicago.—Mr. D. L. Wing, of Charleston, Ill., is President of this company.

Sandy River.—At the annual meeting in Farmington, Me., the following directors were chosen: N. B. Beal, D. M. Bonney, J. H. Bonney, Joel Wilbur, G. D. Wildes. The board re-elected N. B. Beal President and Superintendent; J. E. Thompson, General Freight and Passenger Agent.

Texas & Pacific.—A New Orleans dispatch, of Dec. 16, says that Mr. L. C. Sheldon and Mr. John C. Brown are appointed Receivers of this road. Mr. Brown is Vice-President of the company.

Toledo & Ohio Central.—Mr. H. B. Wood has been appointed General Freight Agent, with office at Toledo, in place of Mr. Hudson Fitch, resigned. Mr. Wood has been for some time agent of the road at Toledo.

Union Pacific.—It is stated that on Jan. 1 next Mr. P. P. Shelby, now General Freight Agent, will be appointed Assistant General Traffic Manager (a new office), and will have his headquarters at Salt Lake, Utah.

Virginia Midland.—At the annual meeting in Alexandria, Va., Dec. 16, the following were chosen: President, F. W. Huidekoper; directors, A. S. Buford, George F. Baker, John S. Barbour, C. M. Blackford, Joseph Bryan, W. P. Clyde, H. C. Fahnestock, C. G. Holland, J. F. Lovell, J. McAnerney, J. C. Maben, W. G. Oakman, W. H. Payne, George Parsons, G. S. Scott, A. D. Shepard. Mr. Huidekoper succeeds Hon. John S. Barbour, who declined a re-election.

West Shore.—Mr. J. W. Musson has been appointed Traffic Manager of this road (late the New York, West Shore & Buffalo), with office at No. 280 Broadway, New York. He has been for several years Manager of the Canada Southern Fast Freight Line.

Worcester, Nashua & Rochester.—At the annual meeting in Worcester, Mass., Dec. 16, the following directors were chosen: George W. Armstrong, J. P. Cook, Frank Jones, Charles Holman, George C. Lord, Frank A. McKean, Charles A. Sinclair, John A. Spaulding, Elijah B. Stoddard. The board elected Charles A. Sinclair, President; F. W. Hammond, Clerk and Treasurer.

PERSONAL.

—Mr. Simon Levy has retired from his position as Receiver of the Shreveport & Houston road, the receivership having been closed.

—Mr. W. A. Walden has resigned his position as Master Mechanic of the Georgia Division of the East Tennessee, Virginia & Georgia road.

—Mr. C. M. Crawford, Superintendent of the Danbury & Norwalk Railroad, was married Nov. 28 to Miss J. L. Van Kirk, of Staten Island.

—It is reported that Mr. J. T. Clark has tendered his resignation of his position as General Superintendent of the Chicago, Milwaukee & St. Paul road.

—Hon. John S. Barbour retires from the position of President of the Virginia Midland Co. at his own desire, after many years of active and faithful service.

—Mr. Hudson Fitch has resigned his position as General Freight Agent of the Toledo & Ohio Central road, to accept a position on the New York, Lake Erie & Western.

—Mr. C. S. Tuckerman has resigned his position as Treasurer of the Atlantic & Pacific Railroad Co., to take effect Jan. 1. He will engage in private business in Boston.

—Mr. Robert Garrett has resigned his position as a director of the Central Railroad Co., of New Jersey. He is reported as saying that he has no longer any interest in the road.

—Calvin Pratt, the civil engineer who recently disappeared from San Francisco, has been arrested near Denver, Col., and taken to San Francisco for trial on the charge of obtaining $40,000 by forgery.

—Miss Laura J. Braden has resigned her position as Treasurer of the Waynesburg & Washington Railroad Co. Miss Braden has for some time past been noted as the only woman in the United States holding a similar office on a railroad.

—Major W. T. Walker, Chief Engineer of the Shreveport & Houston road during its construction, has resigned his position and has gone to Corsicana, Tex., to take charge of the surveys of a proposed line from that place to Sabine Pass.

—Gen. Phineas P. Pease, for some time past Receiver of the Cleveland & Marietta road, has been removed from that position by the United States Circuit Court, on a charge that he had discriminated in favor of the Standard Oil Co. in making rates on oil from the Macksburg oil district.

—Mr. A. Hendee, whose appointment as Master Mechanic of the Jacksonville, Tampa & Key West road was noted last week, was formerly Division Master Mechanic of the Mexican Central road at Calera, Mexico. For some time past he has been Master Mechanic of the Columbus & Cincinnati Midland road, which he now leaves to go to Florida.

—Mr. Robert Garrett, President of the Baltimore & Ohio, was entertained at a dinner given at the Pavilion Hotel, New Brighton, on the evening of Dec. 16, by Mr. Erastus Wiman and leading gentlemen of Staten Island. Over 200 guests were present, including all the leading officers of the Baltimore & Ohio and other prominent men from Baltimore and New York.

—Mr. John Player some time since resigned his position as Master Mechanic of the Central Iowa road, but at the request of General Manager Dudley he has consented to resume the office. On the occasion of his again taking charge of the shops at Marshalltown, he was presented by the employés of his department with a valuable gold watch and an address expressive of their respect and high esteem.

—Mr. Charles H. Fisher, Chief Engineer of the New York Central & Hudson River road, who has been suffering from softening of the brain, as recently noted, has been taken to the insane asylum at Poughkeepsie, N. Y. It is said that he was very much affected on hearing of Mr. Vanderbilt's death, and afterward became so violent that his family felt that the restraint of the asylum was necessary.

—Mr. H. A. Gray has resigned his position as Auditor of the Chicago, St. Paul, Minneapolis & Omaha Co., to take effect Jan. 1. Mr. Gray leaves the company to accept the position of Secretary and Treasurer of the Union Steel Co., of Chicago. Mr. Gray has been with the Omaha since April 1, 1881. Previous to that time he was in the accounting department of the Northwestern at Chicago for seven years.

—Mr. E. T. Jeffery, who has just been appointed General Manager of the Illinois Central road, has been in the service of the company for 29 years. He began as an office boy, but soon after went into the repair shops as an apprentice, and gradually worked his way up through the various grades until he was appointed Assistant Superintendent of Machinery in 1871. He held that position until 1877, when he was made General Superintendent of the road, from which he is now promoted to the new office.

—Ex-Governor B. Gratz Brown, who died at his residence in Kirkwood, Mo., Dec. 13, was best known by his political services. He was born in Frankfort, Ky., in 1826, and settled in Missouri in 1851. He served several terms in the Legislature of that state, one term as United States Senator and one as Governor of Missouri, and in 1872 was a candidate for Vice-President of the United States on the ticket with Horace Greeley. Since his retirement from politics Gov. Brown has been concerned as counsel in a number of railroad cases, and just before his death had completed the sale of the St. Louis, Hannibal & Keokuk road as Special Master of the United States Court.

—A dispatch from Indianapolis, Dec. 14, says: "In the United States Court to-day H. B. Hammond, Receiver of the Indianapolis, Decatur & Springfield Railroad Co. filed a petition asking to be allowed to bring suit against Alphonse Duprat, now a resident of New York. He alleges that, while Assistant Treasurer of the company from 1879 to 1885, Duprat was the custodian of large amounts of money and property for which he never made a settlement, and, further, that there is reason to believe that he still owes a large balance. Judge Woods accordingly issued an order for the Receiver to bring the necessary proceedings against Duprat in the New York courts. Neither Receiver Hammond, the attorney, nor the auditor of the road is in the city, and the details of Duprat's shortage, if any, cannot be ascertained."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1885.	1884.	Inc. or Dec.	P.c.
Eleven months to Nov. 30:				
Boston, Hoosac Tun. & W.....	$435,033	$417,142	I. $17,891	4.3
Cleve., Ak. & C..	445,009	445,042	D. 33	....
Den. & R. G. W.	936,718	751,480	I. 185,238	25.3
Ev. & T. Haute .	689,261	688,260	I. 1,031	0.2
Flint & Pere M..	1,759,835	2,081,143	D. 321,308	15.4
Fla Ry. & N Co.	880,807	878,268	I. 2,539	0.3
Ill Cent., Ill. lines.	5,920,141	5,661,493	I. 258,648	4.5
South. Div.....	3,870,917	3,757,446	I. 113,471	3.0
Iowa lines	1,494,568	1,561,849	D. 67,281	4.3
Kansas City, Ft. Scott & Gulf...	2,349,133	2,201,680	I. 147,453	6.7
Kan. City, Spr. & Mem.....	1,380,919	1,063,988	I. 316,931	29.8
Marq., H. & O..	798.7 1	798,568	I. 183	....
Mobile & Ohio...	1,773,072	1,875,775	D. 102,703	5.5
N. Y., Ont. & W.	1,7 5,592	1,803,965	D. 78,373	4.3
Norfolk & West..	2,498,662	2,449,535	I. 49,127	2.0
Rich. & Dan.....	3,606,144	3,505,960	I. 100,184	2.8
St. Jo. & G and Island	968,728	.....	.....	....
St. L., A. & T. H.:				
Main Line.....	1,104,284	1,228,758	D. 124,474	10.1
Bellev.lle Line.	682,868	679,697	I. 3,171	0.5
St. L., Ft. S. & W.	590,922	462,712	I. 128,210	27.7
St. P., M. & Man.	6,804,576	7,494,758	D. 690,182	9.2
Texas & St. L. .	1,079,003	914,781	I. 164,222	18 0
Va. Midland.....	1,409.661	1,467 047	D. 57,386	3 9
Wab., St. L. & P.	12,712,632	13,734,135	D. 1,021,503	7.4
Western N C....	426,444	398.317	I. 28 127	7.1
Wisconsin Cent..	1,338,228	1,299,504	I. 38,724	3.0
Ten months to Oct. 31:				
Bur., C. R. & No.	$2,513,599	$2,238 877	I. $274,722	12.2
Net earnings...	765,763	668,192	I. 97,571	14 6
Denver & R. G....	5,041,891	4,668,286	I. 373,605	8.0
Net earnings...	1,777.681	1,531.474	I. 246.207	16 1
Des M. & Ft. D...	309.115	290,863	I. 18,252	6 3
Net earnings...	87,618	85,791	I. 1,827	2.1
Oregon Improvement Co ..	2,419,659	2,837,513	D. 417,854	14.7
Rome, W. & Og..	1,415,809	1,419,805	D. 3,996	0.3
Nine months to Sept. 30:				
Hous. & Tex. C..	$2,215,976	$1,712.078	I. $503,898	29.4
Net earnings...	342,559	43,354	I. 299,205	...
Month of September:				
Hous. & Tex. C..	$354,309	$286,893	I. $67,416	23.5
Net earnings..	155,420	100,763	I. 54,666	54.1
Month of October:				
Bur., C. R. & No.	$349,503	$281,414	I. $38,089	13.5
Net earnings...	159,537	105,676	I. 53,861	50.8
Den & R. G.... ..	626.363	597.285	I. 59,078	10.4
Net earnings...	273,378	264,643	I. 8,735	3.3
Des. M. & Ft. D..	42,025	34,859	I. 7,166	20.5
Net earnings...	18,133	9,991	I. 8,142	81.4
G. B., W. & St. P.	36,006	30,2 6	I. 5,790	19.1
Net earnings...	9,591	8,599	I. 992	1.2
Oregon Improvement Co	309,358	333,129	D. 23,771	7.1
Net earnings..	105,770	113,078	D. 7,308	6.5
Oregon & Cal..	106,619	115.593	D. 8,974	7.7
Net earnings...	43,900	44,462	D. 562	1.3
Rome, Wat. & Og.	182,246	176,264	I. 5,982	3.4
Net earnings...	77,716	71,103	I. 6,613	9.3
Month of November:				
Boston, Hoosac Tun. & W.....	$47,522	$37,639	I. $9,883	26 3
Char., Col. & A..	77,735	84 558	D. 6,823	8.0
Cleve., Ak. & Col.	35,994	37,374	D. 1,380	3.7
Col. & Greenville.	78,023	88 162	D. 10.139	11.5
Den. & R. G. W..	95,425	89.555	I. 5,870	6.5
Ev. & T. Haute..	64,784	60,126	I. 4,658	7.7
Flint & Pere M..	175,541	158,315	I. 17,226	10.9
Fla. Ry. & N. Co.	108.213	89 232	I. 18,981	21.3
Georgia Pacific..	73,021	71,778	I. 1,243	1.7
Ill. Cent., Ill. lines.	580,034	548,296	I. 31 738	5.8
South. Div	493,966	550 778	D. 56,812	13 1
Iowa lines.....	155,100	152,169	I. 2,931	1.9
Kans s City, Ft. Scott & Gulf...	233,135	219,416	I. 13,719	6.2
Kan. Ci y, Spr. & Mem	124,664	120,530	I. 4,134	3.4
Manhattan Elevated	590,803	578,163	I. 12,730	2.2
Net earnings...	285,145	275 215	I. 9,930	3.6
Ma q., H. & O....	48,576	30,489	I. 18,087	5.9
Mobile & Ohio...	235,402	253,332	D. 17,930	7.1
N. Y., Ont. & W.	1 5,187	151,970	I. 3,217	2.1
Norfolk & West..	247,622	230,296	I. 17,326	7.5
Rich. & Dan	362,500	371,300	D. 8,800	2.4
St. Jo. & Grand Island	83,580	88,970	D. 5,390	6.0
St. L., A. & T. H.				
Main Line	103,279	104,557	D. 1,278	1.2
Belleville Line.	67,050	60,854	I. 6,196	10.0
St. L., Ft. S. & W.	66 863	46,867	I. 19 996	42 6
St. P., M. & Man.	865,878	879,440	D. 13,562	1.5
Texas & St. L...	172,953	130,296	I. 42,657	32 8
Va. Midland	124 854	115,278	I. 9,576	8.3
Wab., St. L. & P.	1,207,458	1,125,438	I. 82 020	7.3
Western N. C	43 059	38 639	I. 4,420	11.4
Wisconsin Cent..	130,905	127,154	I. 3,751	2.9
First week in December:				
Buff., R. & Pitts.	$26,022	$20,989	I. $5,033	24 0
Chi. & Alton....	179,263	180,637	D. 774	0.4
Chi. & East. Ill.	44,206	40,248	I. 3,958	9.8
Chi., Mil. & St. P.	570 000	536,485	I. 39,515	7.4
Chi. & Nor'west.	491,300	489,700	I. 1,600	0 3
C., St. P., M. & O.	117 600	121.000	D. 3,400	2.8
C., I., St. L. & C.	45 963	46,233	D. 330	0 7
Illinois Central ..	273,000	286 963	D. 13,963	4 9
Iowa lines. ...	35,800	40,168	D. 4,368	10.9
Long Island.....	48,084	47,956	I. 132	0.3
Louisv & Nash..	271,315	$12,405	D. 40,9 0	13 2
Mil. & Northern.	10.305	10,240	I. 65	0.6
St. L. & San F..	100,800	98,800	I. 2,000	2.0

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Coal.

Coal tonnages for the week ending Dec. 5 are reported as follows:

	1885.	1884.	Inc or Dec.	P c.
Anthracite	660,442	721,374	D. 60 932	8.4
Eastern bituminous.....	191,150	191,589	D. 439	0.2
Coke	75,625	57.092	I. 18.533	32.5

Trade in anthracite is quiet, although colder weather has somewhat helped the demand for domestic purposes.

No positive action has yet been taken toward an agreement among the anthracite companies for next year. It is

said that much will depend upon the Reading election, as the future policy of that company will be uncertain until then.

Cumberland coal shipments for the week ending Dec. 5 were 66,651 tons. Total to Dec. 5 this year, 2,621,259; last year, 2,720,599; decrease, 99,340 tons, or 3.6 per cent.

Cumberland coal shipments for the week ending Dec. 12 were 54,423 tons. Total to Dec. 12 this year, 2,675,682; last year, 2,768,595; decrease, 92,913 tons, or 3.4 per cent.

The coal tonnage of the Philadelphia & Reading Railroad for the fiscal year ending Nov. 30 was 12,434,106 tons, against 11,880,751 in 1884 and 13,713,280 in 1883, showing an increase last year over 1884 of 553,355 tons, or 4.7 per cent., but a decrease from 1883 of 1,279,174 tons, or 9.3 per cent.

Cotton.

Cotton movement for the week ending Dec. 11 is reported as below, in bales:

Interior markets:	1885.	1884.	Inc. or Dec.	P. c
Receipts	187.705	184.421	I. 3,284	1.8
Shipments	135,989	164,989	D. 29,000	17.6
Stock, Dec 11	434,343	335,451	I. 98,892	39.5
Seaports:				
Receipts	248,134	289,457	D. 41,323	14.3
Exports	179,942	205,548	D. 25,606	12.4
Stock, Dec. 11	951,288	968,206	D. 16,918	1.7

The total shipments from plantations for the crop year (from Sept. 1) to Dec. 11 are estimated at 3,764,843 bales; the increase, as compared with last year, is 69,514 bales; the increase, as compared with 1883, is 88,570 bales, and the increase over 1882 is 196,319 bales.

Anthracite Coal Tonnage.

The statement of anthracite coal tonnage for November and the eleven months to Nov. 30, as furnished by Mr. John H. Jones, the Official Accountant, is given below; this statement includes the entire production of anthracite coal, excepting that consumed by employés and for steam and heating purposes about the mines:

	—November.—		—E'even months.—	
	1885	1884.	1885	1884.
Phila. & Reading	1,174 452	1,159 606	10,545.064	10,282.172
Lehigh Valley	660,545	592 316	5,478 388	5 429,984
Del., Lack. & W	528,238	509,750	4,598,890	4,727,986
Del. & H. Canal Co.	384.867	310,466	2,983,659	3 067.506
Pennsylvania R. R.	308,964	267,444	3.09 ,38	2,9 7 172
Penn Coal Co	159.086	130,720	1.355.044	1.266.927
N. Y., L. E. & W	62,964	61,652	573 322	385,810
Total	3.279,116	3,031,954	28,626,795	28.087,557

The increase for the month was 247,162 tons, or 8.1 per cent.; increase for the year, 539,148 tons, or 1.9 per cent.

The stock of coal on hand at tidewater shipping points, Nov. 30, was 670,403 tons; on Oct. 31, 661,616 tons; increase, 8,787 tons, or 1.3 per cent., during the month.

Car Movement at Indianapolis.

The train records at Indianapolis show that for the week ending Dec. 12 there were received and forwarded at that point 15,180 loaded cars, against 15,198 in the week preceding. In the corresponding week of 1884 there were handled 14,780 loaded cars, an increase this year of 400 loaded cars. An examination of the movement shows that there was something of an increase in the East-bound shipments, corn and cotton going forward more freely than at the corresponding period of 1884. But for the scarcity of cars the improvement would have been more marked.

Northern Pacific Stock Traffic.

The live-stock and dressed beef traffic of the Northern Pacific road for the season of 1885 is reported as follows, the numbers given being total number of head, whether live or dressed:

	Live cattle.	Dressed beef.	Horses.	Sheep.
Oregon and Washington to Montana	38 070	.....	2,600	25,400
Oregon and Washington east	2.300	.....	2,700	12.920
Montana and Dakota east	68,586	7,029	1,560	7.760
Total	108,956	7.029	6,860	96,080

The total shipments to Eastern markets (excluding shipments to Montana) were: Cattle, 70,886; dressed beef, 7,029; horses, 4,260; sheep, 70,680; total, 152,855 head. Shipments to market for 1884 were: Beeves, 76,560; dressed beef, 3,040; sheep, 20,000; horses, 400; total, 100,000.

Transcontinental Association.

A dispatch from San Francisco, Dec. 14, says: "The Transcontinental Association met at the Palace Hotel this morning, all the lines being represented. T. F. Oakes, General Manager of the Northern Pacific, was elected Chairman. A committee of three was appointed to draft a plan for a reorganization, to take effect July 1 next. The meeting then adjourned till 2 o'clock to-morrow afternoon. The chief subjects for consideration are a division of pool earnings and fixing passenger rates from the East. The great discussion will probably be over the percentage to be allowed the Atchison-Topeka road. This road demands that its claim as a transcontinental road be recognized and its percentage be increased; also, that the California Southern, one of its connecting lines, be admitted a member of the Association."

Passenger Commissions.

The Trunk Lines Passenger Committee has issued instructions forbidding the payment of commissions to passenger agents after Jan. 1. This action was communicated to the Western connecting lines, with the request that they cooperate in the action.

Special Rates for Hauling Stock Cars.

A special dispatch from Springfield, Ill, Dec. 8, says: "In the matter of the complaint of the Burton Stock Car Co., of Boston, against the railroads belonging to the Southwestern Association, for unjust discrimination in charging a higher rate for the transportation of their cars than for ordinary stock-cars, a decision was rendered to-day by the Railroad & Warehouse Commissioners adverse to complainants. It was complained that the charge for transportation of the cars of the complainant was 5 cents per car per mile, while ordinary stock-cars paid 0¾ cent for the same service. The Commission decided that the Burton stock-car is of a special class, and constructed with reference to additional and better accommodations for its patrons than the ordinary car; that higher rates are charged shippers for their use, and, therefore, the railroads have power to charge more for hauling them. The decision applies to all transportation companies in Illinois whose cars afford better accommodations than the ordinary car."

The Chicago-Ohio River Pool.

At a meeting in Chicago, Dec. 9, it was agreed to extend this pool, which would expire at the close of this year, through the year 1886. Statistics submitted showed the aggregate earnings from the pool traffic to have been a little more than $1,500,000, and that the variations from the allotted percentages amounted to only $23,000. The Chicago, St. Louis & Pittsburgh and the Louisville, New Albany & Chicago have carried more than their shares. The question of a revision of the present percentages was referred to the Chairman, V. T. Malott, the Commissioner, L. D. Richardson, and the Secretary, B. E. Haud, who are to report to the Executive Committee.

At the meeting in Chicago last week it was resolved to form an additional pool, covering all business between Chicago and Cairo, Evansville, New Albany, Jeffersonville, Louisville and Cincinnati. This pool is to begin as soon as the consent of the lines in interest can be obtained, but not later than March 1. The percentages recommended are: Wabash, 7.5; Illinois Central, 10.5; Chicago & Eastern Illinois, 25; Green Line (Chicago, St. Louis & Pittsburgh; Jeffersonville, Madison & Indianapolis; Cincinnati, Hamilton & Dayton), 18; Louisville, New Albany & Chicago, 14; Cincinnati, Indianapolis, St. Louis & Chicago, 25.

The application of the Chicago & Atlantic for admission to the pool was laid over for further consideration.

Southern Railway & Steamship Association.

Louisville dispatches report an agreement has been concluded by which the Mobile & Ohio, which is not a member of the Association, will hereafter act in accord with the lines in it in making and maintaining rates on traffic from western points to all southern competitive points.

Northwestern Traffic Association.

The following statement is made of the traffic in this Association for the month of November:

	Tons.	Amount
West-bound	78,265	$344,260
East-bound	114 771	359,115
Wheat milled at local points	21,198	46,768
Total	214,234	$750,143

The St. Paul, the Northwestern and the Burlington roads carried somewhat over their proportion. There was an increase in west-bound, but a decrease in east-bound business.

San Francisco Wheat Exports.

San Francisco exports in November were 66,878 barrels of flour and 883,418 bushels of wheat. For the five months of the California crop year from July 1 to Nov. 30 the exports were as follows, flour in barrels and grain in bushels, flour being reduced to wheat in the totals:

	1885.	1884.	Decrease.	P. c.
Flour	457,988	490,121	32,133	6.6
Wheat	4.653,658	10,405,060	5,751.402	55.3
Total, bus.	6 943,598	12,855,685	5,912,087	46.0

These figures include three cargoes of Oregon wheat reshipped from San Francisco.

Traffic to Lake Superior over the St. Paul & Omaha.

The total shipments over this company's line from St. Paul to Washburn (near Bayfield) during the past season amounted to 114,039 tons, including 284,995 barrels of flour; while about 1,070,000 barrels of flour were shipped from St. Paul and Minneapolis *via* Duluth. The shipments to Washburn were large in May, but very small in the three summer months.

Western Weighing Association.

The number of cars weighed has been:

	1885.	1884.	Increase.	P. c.
November	72,300	57,666	14,640	25.4

The number weighed last October were 81,594 cars. The cars weighed are almost exclusively those going from Chicago westward loaded with merchandise.

Central Iowa Traffic Association.

The total business in this Association in November is as follows: West-bound, tons, 8,319; amount, $41,463; East-bound, tons, 563; amount, $3,189. The Rock Island, the Northwestern and the Wabash exceeded their proportion, the Burlington and the St. Paul roads falling short.

Western Freight Association.

The total business in the pools of the Asscciation in November was as follows:

	West-bound.	East-bound
Through freight pool	$62.591	$132.714
Omaha pool	144,007	33,571
Range cattle pool	....	15,361
Total	$206,598	$181.646

The St. Paul, the Rock Island, the Wabash and the Northwestern exceeded their proportions for the month.

Southwestern Railway Association.

The earnings in this Association in November were reported as follows:

Merchandise pool	$748,142
Lumber pool	204,402
Total	$952 544

The Chicago & Alton and the Missouri Pacific exceeded their proportions in both pools, and the Chicago, Burlington & Quincy ran over in the lumber pool. The other lines fell short in both pools for the month.

A Question of Special Rates.

A good deal has been said in the dispatches lately about the rates to Butte, Montana, over the Union Pacific, on salt, which is largely used in the great reduction works there, and the announcement has been made that the works must be closed if the rates were not reduced. The company's side of the question is presented in the Omaha *Republican* as follows:

"The matter is a subject to which the officials of the road have given careful attention for some time past. Desiring to promote the enterprise at Butte, they reduced the rates on certain essential articles—like coal—to a considerable extent a good while ago. The owners of the reduction-works were not content with this, but wished the rates on everything made uniformly low. The railroad officials replied that the concessions already made would take more than one-half the earnings of the Utah & Northern Division, and they must wait until the traffic adjusted itself to the new tariff. Butte is a growing place, and it is believed that the increase in general business will, at an early day, warrant a more general reduction of the rates; but to comply at once with the present demand would compel the stockholders of the road to assess themselves to pay the interest on the bonds. It is said that the reduction works at Butte are very profitable, one of them earning as much as $50,000 a month net, and that there is small probability that they will shut down if the railroad managers refuse a concession which would not amount to one-quarter of that sum. Evidences abound that it is the policy of the Union Pacific since Mr. Adams became President to encourage industries along the lines by affording good train service and reducing rates as fast as possible. But the road must be made to earn something, and probably if the people of Butte were to have the alternative presented as to which should be closed down, the reduction-works or the railroad, it would not take them long to decide. However, it is not the business of a great railroad to threaten, and the above is purely the railroad side of the question. The Butte grievance is in the hand of Traffic Manager Kimball, and it is not doubted that he will be able to arrange it to the satisfaction of all parties concerned."

RAILROAD LAW.

Discrimination in Rates.

In the case of Schofield, Shirmer & Teagle against the Lake Shore & Michigan Southern Co., the Ohio Supreme Court decides as follows:

1. A railroad company chartered under the statutes of this state is a common carrier of freights intrusted to it for transportation, and is vested by its charter with the right of eminent domain and other franchises of a public nature and exercises public duties and those of a quasi public office, and is subject to judicial control to prevent an abuse of the privileges and powers so granted.

2. Whether a common carrier, at common law, in the ordinary case, where no facts exist making a discrimination among shippers, injurious or ruinous to some of them, is only bound to transport freight at a reasonable rate, and not necessarily at a rate equal to all or not, yet when the lower rate is either intended to give, or has the necessary effect of giving, an exclusive monopoly affecting the business and destroying the trade of other shippers, the latter have the right to require an equal rate for all under like circumstances.

3. Where such a corporation as a common carrier of freights in consideration of the fact that a shipper furnished a greater quantity of freight than other shippers during a given term agrees to make a rebate on the published tariff on such freight to the prejudice of other shippers of like freights under the same circumstances, such a contract is an unlawful discrimination in favor of the larger shipper, tending to create monopoly, destroy competition, injure, if not destroy, the business of smaller operators, contrary to public policy, and will be declared void at the instance of parties injured thereby.

4. Such a contract of discrimination cannot be upheld simply because the favored shippers may furnish for shipment during the year a larger freightage in the aggregate than any other shipper, or greater than all others combined; a discrimination resting exclusively on such a basis will not be sustained.

5. Although a court will ordinarily look to the interest of the common carrier as an element in the case, the validity of such a contract will not be sustained by the courts simply because the business done under it is "largely profitable" to him.

6. Where it appears that the plaintiff's business is such as to make him a frequent shipper and a continuous series of shipments is necessary in conducting his business and to secure a remedy would lead to a multiplicity of actions at law, the courts, in order to save a multiplicity of suits and to do full and adequate justice to the injured party, will intervene by injunction to prevent the threatened injury and wrong, and it is not prerequisite on such a state of facts that plaintiffs first establish their rights by an action at law.

7. When a railroad company is a corporation consolidated under the statutes of several states, and its road reaches into several states, its illegal acts of injurious discrimination committed or threatened in this state to the business of others, either here or along the line of said railroad in this state or elsewhere, may be ignored by the courts of this state.

The plaintiffs in this case are a firm of oil refiners, and the discrimination in rates consisted in giving special rates on oil to the Standard Oil Co. The case has been in litigation for some time.

OLD AND NEW ROADS.

Albemarle & Raleigh.—A Raleigh dispatch says that this road has been sold to the Wilmington & Weldon Co., but does not state the terms on which the transfer was made. The road runs through some of the best country in Eastern North Carolina, extending from Tarboro, the terminus of a branch of the Wilmington & Weldon, east to Williamston on the Roanoke River, 33 miles. The road was chiefly owned in New York, and its extension from Tarboro to Raleigh has been under consideration.

Asheville & Spartanburg.—Tracklaying on the extension of this road from Hendersonville, N. C., to Asheville, is now completed. The work of finishing up is in progress, and trains will run through to Asheville about Jan. 1. The extension is 20 miles long, making the whole length of the line from Spartanburg, S. C., to Asheville, N. C., 70 miles. The extension was nearly all graded over 10 years ago, when the line was completed to Hendersonville; at Asheville it connects with the Western North Carolina road. The road is controlled by the Richmond & Danville.

Atchison, Topeka & Santa Fe.—This company has agreed to extend its Florence, Eldorado & Walnut Valley Branch from the present terminus at Douglas, Kan., southward to Winfield, on the Southern Kansas line, a distance of 21 miles, provided local aid is given. The people of Winfield, Kan., have voted to give $60,000, provided their town is made a division station and shops established there.

Baltimore & Ohio.—This company's engineers are now making surveys for the new line from Bound Brook to Elizabethport. It is said that work will be begun as soon as possible, and that a ferry will be established on which trains can be carried across Staten Island Sound, should there be any delay in the building of the bridge there.

A bill to authorize the construction of the bridge over Staten Island Sound has already been introduced in Congress, and will be considered as soon as the committees are appointed.

Beech Creek, Clearfield & Southwestern.—The stockholders' committee has issued a circular requesting the stockholders to pay an assessment sufficient to pay off the debt of $1,300,000 for which all the company's bonds are pledged. It is understood that favorable replies have been received from all the stockholders except Mr. F. B. Gowen.

Boston & Lowell.—Officers of this company deny reports that the company has taken any part in the attempt to prevent the lease of the Worcester, Nashua & Rochester road to the Boston & Maine.

On Dec. 14 this company began running trains through to Jefferson on the Central Massachusetts line, which it now operates. Heretofore trains have only run to Hudson, but repairs of the road have now been so far completed that it is open to Jefferson, which is the end of the track laid.

Boston & Maine.—The suit briefly referred to last week to enjoin this company from leasing the Worcester, Nashua & Rochester road is brought by the trustees under the mortgage of the Eastern Railroad. Another suit has been brought by the trustees to recover from the Boston & Maine Co. the sum of $43,104, being the balance of net earnings for the month of September, 1883, to which the trustees claim they are entitled under the terms of the mortgage. The claim is that for that month—which was the last month before the lease of the road—the company charged up certain improvements of road which were not properly a charge against the net earnings, and that the trustees are therefore entitled to the balance to be applied to the reduction of the bonded debt.

Centralia & Chester.—This company has filed artices of incorporation to build a railroad from Centralia, Ill., on the Illinois Central road, southwest to Chester on the Mississippi River, a distance of about 65 miles.

Central, of New Jersey.—In the suit to set aside the lease of this road to the Reading, the account of the Reading Co. was definitely set forth as follows by Assistant Comptroller S. M. Williams in his evidence before the Master. He said that on Sept. 1, 1885, there was due to the Central exclusive of claims for bonds, $2,569,021; balance claimed by the Reading (in bonds) on account of Central indebtedness paid, $1,433,145; on account of betterments, $292,985 or a total of $1,726,130, leaving balance due the Central for rent, $842,891. In June or July, 1885, the witness had an interview with President Little, of the Central, in relation to the claims of the Reading, some of which were objected to by the Central officers. Up to and including May 31, 1885, the claim for betterments was $234,066. Of this $48,505 was in the nature of new work and $185,561 of the nature charged to operating expenses of the Central. On the New Jersey Southern $69,291 was claimed for betterments, of which amount Mr. Little allowed $55,214 for operating expenses and $14,077 for new work. These figures include the new freightyard tracks, etc., at Bridgeton, on the Vineland Branch. The New York & Long Branch Division being operated under a joint contract with the Pennsylvania Road, in which special provisions for betterments were included, was not considered in the conference with Mr. Little, so that at that time out of the $303,357 claimed as betterments by the Reading only $62,582 was allowed under this head by the President of the Central.

The taking of testimony has been closed, and the Master will submit his report to the Court, where the case will shortly come up for argument.

Chicago & Atlantic.—In the suit brought by certain bondholders to compel the New York, Lake Erie & Western and the New York, Pennsylvania & Ohio companies to pay interest on the bonds of the Chicago & Atlantic, the United States Circuit Court in New York has sustained the demurrer filed by the defendants, and dismissed the case, holding that there was no agreement on their part to pay the interest to the bondholders, and that plaintiffs therefore had no right to maintain the suit.

Chicago & Northwestern.—This company's Northern Illinois Branch, extending from the Madison line at Belvidere, Ill., southward to Spring Valley in Bureau County a distance of 77 miles, was opened for business Dec. 14. The stations, with the distances from Belvidere, are as follows: Herbert, 8.5; Henrietta, 13.0; Sycamore, 21.2; Sycamore Junction, 22.0; De Kalb, 26.5; Elva, 31.9; Newtown, 35.3; Shabbona Grove, 42.0; Rollo, 46.4; Earlville, 52.6; Triumph, 60.2; Troy Grove, 63.9; Siding, 70.2; Shaft No. 2, 75.7; Spring Valley, 77.0 miles.

The Northern Illinois Railway is a proprietary line, all the stock being owned by the Chicago & Northwestern Co. It has been built to enable the company to reach the coal mines of La Salle and Bureau County by a line of its own.

This company gives notice of its intention to build a branch 4 miles long, from Winona Junction, Wis., to the town of La Crosse.

Chicago, Rock Island & Pacific.—It is reported that this company will extend its new St. Joseph Branch from St. Joseph, Mo., down the west side of the Missouri through Atchison and Leavenworth to Kansas City, and that it will also build a branch from St. Joseph to Topeka, Kan. No definite action has been taken by the company, however, toward building these lines.

Chicago, St. Paul, Minneapolis & Omaha.—The arguments in the suit brought against this company by the Farmers' Loan & Trust Co., of New York, to subject the land grant to the lien of $758,000 of bonds issued by the Chicago, Portage & Superior Co., were closed in the United States Circuit Court last week, and the case was taken under advisement by the court. It is not known when a decision will be rendered.

Cleveland & Marietta.—The United States Circuit Court has removed General Pease, the Receiver of this road, on a charge made that he had agreed to allow the Standard Oil Co. rebates on shipments of oil from the Macksburg district, and also to pay over to that company a portion of the rate received on oil shipped by other parties. General Pease claims to have had legal opinion to the effect that he was justified in granting the Standard Oil Co. the rebate on the ground that it shipped a very much larger quantity than any other party, but the court thought differently and held that the contract involved an unjustifiable discrimination. The Court replaced General Pease by Mr. A. T. Wykoff, of Columbus.

Covington & Macon.—The contract for building this road has been let to E. C. Meachen, who has established his headquarters in Macon, Ga., and will let sub-contracts as soon as the location of the line is finally established. The road is to run from Macon, Ga., northward through Covington to a connection with the Atlanta & Charlotte Air Line, near Buford, and will be about 95 miles long.

Dayton & Ironton.—The earnings of this road in October were $25,037, and the expenses $18,854, making the net earnings $6,183. Rentals, etc., were $1,216, leaving a surplus of $4,967 for the month.

Delaware & Hudson Canal Co.—The statement for this company's leased lines in New York for the year ending Sept. 30 is as follows:

	Earnings.	Net earn.	Charges.	Deficit.
Albany & Susque'na..	$2,285,698	$675,117	$1,011,439	$336,322
Cherry Vy., S. & A....	23,358	*8,801	.....	8,801
N. Y. & Canada.....	613,572	203,781	266,628	62,847
Rens. & Saratoga....	2,088,422	805,110	838,211	33,101
Utica, Clint. & B....	218,802	24,177	105,081	80,904
Total.....	$5,229,852	$1,699,384	$2,221,359	$521,975

* Deficit.

The Rome & Clinton road is included with the Utica, Clinton & Binghamton in the statement.

Denver & Rio Grande.—The statement for October and the ten months to Oct. 31 is as follows:

	October.		Ten months.	
	1885	1884.	1885.	1884.
Earnings.....	$626,363	$567,285	$5,041,891	$4 668,286
Expenses.....	352,985	302,642	3,270,230	3,136,833
Net earnings.	$273,378	$264,643	$1,771,661	$1,531,453
Other receipts..	6,135	.....	52,187	.....
Total.....	$279,513	.....	$1,823,848	.....
Current charges.	61,212	.....	278,446	.....
Balance	$218,301	.....	$1,545,402	.....

For the ten months the gross earnings increased $373,605, or 8 per cent., and the expenses $133,397, or 4.2 per cent., leaving an increase of $240,208, or 15.7 per cent., in net earnings.

Holders of general mortgage bonds have begun suit to stay the foreclosure proceedings, on the ground that the road is now earning interest on the bonds.

Denver & Rio Grande Western.—The gross earnings of this road in October were $126,883; expenses were $66,703, leaving the net earnings $60,180. Taxes and rental of equipment amounted to $5,500, leaving a net balance of $54,680 for the month.

Eastern.—At the annual meeting in Boston last week the election of directors by the bondholders resulted in the success of the opposition ticket, four of the directors chosen being new to the board. The old members who were candidates for re-election have given notice that they will contest the election in the courts on the ground that the teller illegally refused to receive the ballots of a number of bondholders who were entitled to vote.

The stockholders, whose meeting was at the same time, held no election, but simply adjourned over until Jan. 9.

At the special meeting held by the stockholders it was resolved by a very large majority to ratify the leases of the Portland & Rochester and the Worcester, Nashua & Rochester roads to the Boston & Maine Co. It will be remembered that under the terms of the lease of the Eastern road to the Boston & Maine, all new leases and contracts made by the Boston & Maine have to be ratified by the stockholders of both companies.

El Paso, St. Louis & Chicago.—A company has been organized under this name to build a new line from El Paso, Tex., eastward. The company offers to build its line from El Paso to White Oaks, N. M., within six months, provided it receives a bonus from the city of El Paso.

Georgia Pacific.—This company on Dec. 10 began to operate the branches of the Mobile & Ohio, extending from Artesia, Miss., east to Columbus, 14 miles, and west to Starkville, 11 miles. This practically extends the line from Columbus, heretofore the terminus of the Western Division, west 25 miles to Starkville. It is understood that the branches are not sold or transferred, but that the Georgia Pacific Co. operates them under agreement with the Mobile & Ohio, and as a matter of convenience.

Gogobic & Lake Superior.—This company has filed articles of incorporation to build a railroad from Hurley, Wis., northward to a point on Lake Superior near the mouth of the Montreal River. The distance is 14 miles, and the road is intended chiefly to carry iron ore.

Grand Trunk.—This company's statement for October and the four months from July 1 to Oct. 31 is as follows:

	October.		Four months.	
	1885.	1884.	1885.	1884
Earnings.....	£298,963	£335,861	£1.091,898	£1,255,669
Expenses	216,917	231,550	822,419	887,888
Net earnings....	£82,046	£104,311	£269,479	£367,781

For the four months the gross earnings decreased £163,771 or 13 per cent., and the net earnings £98,302, or 27 per cent.

For the four months the earnings of the lines owned west of Detroit were:

	Chi. & G. T.		Det., G. H. & M.	
	1885.	1884.	1885.	1884
Earnings.....	£182,750	£222,184	£92,372	£99,574
Expenses.....	154,081	167,085	61,648	64,535
Net earnings	£28,569	£55,099	£30,724	£35,039

The Chicago & Grand Trunk lost £39,434, or 17.8 per cent., in gross earnings, and £26,530, or 48.2 per cent., in net earnings. On the Detroit, Grand Haven & Milwaukee the decrease in gross earnings was £7,202, or 7.3 per cent., and in net earnings £4,315, or 12.3 per cent.

Houston & Texas Central.—The following statement is made for September and the nine months to Sept. 30:

	September.		Nine months.	
	1885.	1884.	1885.	1884.
Earnings.....	$354,209	$286,893	$2,215,976	$1,712,078
Expenses	198,880	186,130	1,873,417	1,668,724
Net earnings...	$155,429	$100,763	$342,559	$43,354

Renewals and betterments are included in expenses; for the nine months they amounted to $579,344 this year and $493,441 last year.

Joliet, Aurora & Northern.—Grading is now in progress on this road between Aurora, Ill., to Joliet, and a considerable part of the work has been completed. Contracts have been let for the ties for the line.

Kansas & Gulf Short Line.—A dispatch from Tyler, Tex., Dec. 10, says: "On Dec. 2 the Texas stockholders in the Kansas & Gulf Short Line presented to District Judge McCord in chambers a bill in equity praying the appointment of a receiver for that road. The prayer has been granted and James G. Garrison appointed Receiver. This action was superinduced by a dispute which has arisen between the New York stockholders, represented by Messrs. R. H. Barker and Hugh Stevenson, and the Texas stockholders. The New York parties claim that by a special agreement between these opposing factions they were to own and control 52 per cent. of all stock of the road, but that by reason of the unauthorized and fraudulent issuance of $10,500 worth of stock the Texas stockholders have obtained a majority. The Texas stockholders aver that the issue of this new stock was under due authority, and was done in good faith to purchase rolling stock and equipments for the road. A suit at law is pending, but since all parties evince a desire to settle the dispute amicably, it is hopedthat it will be compromised. W. S. Herndon, President, left for New York to-night with a view to affecting an amicable adjustment. This new road is in a prosperous condition."

The road, which has just been completed, is a narrow-gauge line extending from Tyler, Tex., to a junction with the Houston, East & West Texas at Lufkin. It is 89 miles long.

Lehigh & Hudson River.—This company has made a traffic contract with the Lehigh Coal & Navigation Co., under which it is expected that the traffic of the road will be largely increased. The Lehigh Coal & Navigation Co. will make large shipments of coal over the road, and will also furnish cars to carry this freight. To secure the performance of the contract, $400,000 of the stock of the Lehigh & Hudson River Co. is deposited in trust, and the Lehigh Coal & Navigation Co. names the Vice-President and six directors as its representatives in the management of the other company.

Long Island.—This company is making arrangements to extend its Glen Cove Branch from Roslyn through Oyster Bay to Huntington, a distance of about 15 miles. The road will reach a section of the north shore of Long Island, which is now some distance from a railroad and which is one of the best portions of the island for summer residences.

Louisville, Evansville & St. Louis.—The committee has succeeded in harmonizing the various conflicting interests represented, and a new plan of reorganization has been agreed upon, which provides that securities assenting to the plan shall be deposited with the International Trust Co. of Boston, subject to the order of William T. Hart, Jonas H. French, John Goldthwait, Isaac T. Burr, and Walter S. Blanchard, of Massachusetts, and Alexander P. Humphrey and James M. Felter, of Kentucky. Payments in cash must be made upon the deposit, on the basis of $4 for each $1,000 of special notes, $5 for each $1,000 first mortgage bond, $2.50 for each second mortgage bond, $1.25 for each income bond, and 6¼ cents for each share of stock. The above committee is to purchase the property at foreclosure sale, paying for the same with the securities so deposited as far as possible. It is further empowered to organize new corporations in Indiana and Illinois under the old title, and with the assent of two-thirds of the second mortgage bonds, to extend the road to St. Louis, or the Mississippi River, and consolidate the separate roads later. The new corporation is to issue $2,000,000 first mortgage 40-year 6 per cent. gold bonds, subject to the existing $900,000 mortgage on the Evansville Division, and excepting the franchise of the St. Louis extension; $3,000,000 mortgage 50-year gold bonds, bearing no interest the first year, 2 per cent. the second and third years, 3 per cent. the fourth year, 4 per cent. the fifth year, 5 per cent. the sixth year, and 6 per cent. thereafter; the bonds to have a voting power of 10 votes for each $1,000 bonds on registry 60 days before the time for voting; $1,500,000 preferred stock entitled to 5 per cent. non-cumulative dividends; $3,500,000 common stock. The $2,000,000 first mortgage bonds are to be given at par for the $27,503 payable notes with interest to date of bonds; at par for the $280,967.30 special notes at 70 with interest; at par for the first mortgage coupons of 1883, '84, '85 and '86, the balance to be used for foreclosure charges, prior liens, etc., so far as necessary, and whatever is left to be put into the treasury. The other securities are to be issued as follows: To the holder of each $1,000 old first mortgage bonds, which all coupons maturing on after April 1 1887, attached, $1,000 at par in the said new second mortgage bonds; to the holder of each $1,000 old second mortgage bonds, with all coupons maturing on and after March 1, 1887, attached, 10 shares, or $1,000 at par, in the said new preferred stock; so much of the new prefered stock shall be delivered *pro rata* to the owners of the coupons of the old second mortgage bonds maturing on Sept. 1, 1882, and March 1, and Sept. 1, 1883, 1884, 1885 and 1886, deposited as shall equal, at the par of the stock, the face value of the said coupons deposited; to the holders of the said $280,967 of special notes, 30 per cent. of the principal and interest of the said notes in the said new preferred stock at par; to the holder of each $1,000 of old income bonds, five shares, or $500 at par, of the said new common stock; to any creditor of the former corporation, upon claims other than those before named, there may be issued, upon demand made within six months after said sale, such amount of the said new stock as shall be agreed upon between the new corporation and such creditors, not exceeding $500 at par of the said stock for each $1,000 of the amount of the respective claims; to the holder of each four shares of old common stock, one share, or $100 at par of the said new common stock, and *pro rata* for amounts less than four shares in scrip convertible into stock in even $100 amounts. The compensation of the trustees shall not exceed $7,000 and necessary expenses, apportioned as they may elect.

Louisville, New Albany & Chicago.—This company has been given notice of the termination of the contract under which it now uses the Indianapolis, Peru & Chicago track into Indianapolis. The company purposes building a line of its own into the city and has had surveys made of three routes.

Louisville, New Orleans & Texas.—A Vicksburg dispatch says that this company has bought the Mobile & Northwestern road, a narrow-gauge line running from Clarksdale, Miss., northwest to Glendale, 31 miles. The road will be changed to standard gauge and a ferry transfer established between Glendale and Helena, Ark., connecting with the Helena Branch of the Iron Mountain road.

Mexican Central.—The following circular to the bondholders, issued on Dec. 15, explains itself:

"The company expected to pay the interest due Jan 1, 1886, and thereafter to continue payment of all interest out of net earnings and subsidy, and by reason of the improved credit resulting therefrom, to obtain money at a reasonable rate to pay off the coupon notes, payable at the company's option, to build to Guadalajara, and to connect the Tampico division with the main line; thus securing valuable feeders and making productive property, now isolated, which cost $4,400,000 in gold and on account of which $5,200,000 of first-mortgage bonds are outstanding. This expectation was strengthened by the net earnings and subsidy receipts, until June last, when the Mexican government suspended all payments. The suspension not only cut off the receipts from subsidy collections, but lessened public confidence, depressed business, and materially reduced the earnings of the property. It is expected that the government will resume payment of the subsidy Jan. 1, 1886, paying a small part in cash, gradually increasing the rate until the full amount provided by law is reached, which, under the government's proposition, will be in 1891. It will require a long time, however, for public confidence to recover from the shock, and for the development of Mexico to assume the active proportions which has been reasonably expected in the immediate future. The company is therefore unable to pay the interest on its first-mortgage bonds. These bonds are secured by mortgage lien on the franchise, real estate, railway, telegraph, equipment and appurtenances. The subsidy is not included in the mortgage, and the bonds have no lien upon it. Until it is earned, it cannot be pledged; but so far as earned it becomes the property of the company and subject to its disposal. Out of its earned subsidy, the company has already pledged $5,000,000 to fund the debt necessarily contracted to give value to the property upon which the first-mortgage bonds are secured, by uniting the northern and southern divisions after all the money derived from the sale of the bonds and other securities had been exhausted; and $5,760,000 to secure to the bondholders payment of coupons Nos. 6, 7 and 8, with interest thereon. These sums are represented by certificates received from the government, and deposited as collateral with the Boston Safe Deposit & Trust Co., trustee. The company has also earned, but has not yet received, certificates to an amount above $4,500,000, which, with the remnant in the company's possession, will make $5,000,000 of subsidy certificates unpledged. The franchise under which the road is and must be operated, even under a foreclosure, entails such obligations as to governmental supervision, free carriage of the mails, and low rates for government forces and supplies, as to make the possession of the subsidy of great value to the owners of the property. Considering the circumstances and the necessity of strengthening and developing the property upon which the bonds are at present secured, the directors, themselves holders of large amounts of the bonds, recommend and will themselves accept the following offer hereby made by the company to the bondholders, namely: The bondholders will present their bonds to be stamped as follows:

"'In consideration of and subject to the provisions of the indenture of Dec. 1, 1885, between the railway company and the trustee within named, it is agreed that the 7 per cent. interest promised within shall be paid as follows: 4 per cent. shall be paid firm, and the remaining 3 per cent. shall be non cumulative and payable only out of the balance of net earnings on hand April 1 and Oct. 1 in each year, after payment of taxes, all other interest (excluding the income bonds), all expenses for operating and repairs, and such improvements and additions to the property as the directors of the railway company deem essential, and which shall be subject to the lien of this bond; all interest payments shall be made in accordance with the new coupons attached to the within bond.'

"The present coupon sheet will be severed from the bond and deposited with the Boston Safe Deposit & Trust Co., the

trustees of the first-mortgage bonds, to be kept alive and in force for the benefit of the respective holders in case of default or in case of foreclosure of the mortgage from any cause. The company will attach to the bonds a new sheet of semi-annual coupons bearing the same numbers and dates as the present coupons, changed, however, to meet the new basis of interest. In the indenture above referred to the company will include all its rights, title and interest to the subsidy now earned, subject to the existing liens of the coupon notes and the debentures; providing that all said subsidy shall be used to pay interest not payable only out of the net earnings, to pay the coupon notes and debentures and for the purchase and cancellation of the bonds stamped as above provided, until all such bonds have been paid and canceled. The company will be ready to stamp said bonds and to exchange coupon sheets at its office in Boston, and the new coupon No. 9 will be payable at the Boston Safe Deposit & Trust Co. on and after Jan. 1, 1886."

Mexican Railroad Notes.—A dispatch from the city of Mexico, Dec. 10, says: "The bill giving the President authority to treat with the railroad companies with regard to the modification of their respective concessions has now passed both houses of Congress and become a law. The railroad representatives will immediately resume active negotiations for the modification of the terms of the concessions fixing the time for the completion of their lines."

The following notes are from the *Mexican Financier* of Dec. 5:

Nogales, the northern terminus of the Sonora Railway, is growing fast, and will soon have a reduction works capable of smelting the most refractory ores. Should the railway shops be placed there, the town will become an important point.

An American railroad paper recently published the following paragraph: "The Mexican Central Railroad shops have recently turned out several locomotives that are said to be the largest in the world, and are especially adapted to the heavy grades of 185 ft. to the mile and the 20° curves which exist on that line." The above paragraph conveys considerable misinformation in a few lines. In the first place the Central Railway Co. does not build locomotives, and, consequently, has no locomotive shops, in the second place the heaviest grades on the road are 79 ft. to the mile and not 185, while the sharpest curves are but 14 degrees and not 20 as stated. The locomotives described exist only on paper, there being only drawings of some proposed powerful machines.

Mr. Juan Peon Contreras, who contracted with the government in 1882 to build the Eastern Railway of Yucatan, asks for an extension of his concession, having been unable to fulfill the terms. He has asked to be authorized to build his road and to operate it for 79 years, and to be allowed to construct in connection with the road either a telegraph or a telephone line, which, leaving the city of Motul, will go to Chan Santa Cruz, thence to Ascension Bay, on the east coast of Yucatan, connecting several important towns. If permission to go on with his railway is given him, Mr. Contreras asks that he be given 15 years for construction, agreeing to build at least four kilometers within two years, and thereafter eight kilometers annually. He offers to deposit $5,000 forfeit money. A number of interested parties have offered to take the bonds of the company, giving in return cash or material.

The fuel question is likely at no very distant date to be satisfactorily solved for the Central and the National railroads, even if coal of good steam-making quality is not found directly on their respective lines. At El Paso there is strong talk of pushing through the projected railway line to White Oaks coal fields, 150 miles to the northeast of that enterprising city. The coal there is of first-class quality, and the fields are of large extent. There is every reason to believe that the proposed railroad would pay a good dividend, for coal is an article of prime necessity at El Paso, where manufacturing enterprises require it, and the Central Railway Company would be a very heavy purchaser. The road to White Oaks would, on its way up into the hills, meet nowhere a heavier grade than 80 ft. to the mile, while on the way down to El Paso the worst up grade to be met is but 10 ft. to the mile; in fact, the down haul of coal would be very easy and inexpensive. Of course the cars would return empty on their way back for reloading at White Oaks, and the cost of haul would be light. The coal could be put on the cars and delivered at El Paso for $3 per ton, as against $7 now charged for New Mexican coal. Not only would El Paso and the Central road get cheap coal, but the city of Chihuahua and points lower down the road. Cheap coal may also be had on the Central, when Mr. Huntington shall carry out his project of extending the International road down from Monclova to Villa Lerdo, at the outlet of the rich Laguna country. This section of the International will probably be built within two years, should business continue to improve with the United States. The coal which the International road would bring into Central Mexico would come from the Sabinas coal-fields, and the fuel could undoubtedly be delivered at figures which would give a powerful stimulus to manufacturing industries in the interior of the republic. It is extremely unfortunate for the development of our mining industry that cheap coal is not to be had in abundance on the lines of the various Mexican railways, for then we might profitably smelt our own ore and not have to send it not only to Kansas City, but to Wales and Germany. The National road, when its Northern Division is built, will, without doubt, run a spur line up to the Sabinas coal-fields and thus procure a supply of cheap fuel. The construction of the National's Northern Division and of the Huntington road would give the Central lively competition as far as regards its own Northern Division.

Milwaukee & Dubuque.—This company has filed articles of incorporation in Wisconsin for a road from Elkhorn southward to the Illinois state line.

Milwaukee, Lake Shore & Western.—A survey is now in progress for a branch of this road from Watersmeet, Mich., northward 15 miles, into a large tract of line land. This branch, it is stated, is to be extended hereafter to the Republic mines.

Minneapolis, Sault Ste. Marie & Atlantic.—The annual report of Mr. W. D. Washburn, President of this company, states that arrangements have been made for the use of the Northern Pacific terminal facilities in Minneapolis. A tract of 160 acres of land has also been purchased in Northeast Minneapolis, which will be required as soon as the line is completed west from Turtle Lake. East of Turtle Lake the road has been completed for a distance of 70 miles, equipped and paid for, without a dollar of outstanding indebtedness, except a few thousands for equipment, and for the payment of which full provision has been made. Sanders Point, about 5 miles from Escanaba, has been selected as the terminus of the line on Lake Michigan. At Sault Ste. Marie no definite arrangements have been made for terminal grounds at that point, but the large property holders have shown a disposition to meet the company in a liberal way in this connection. The earnings of the road so far as operated have been in excess of the operating expenses, with indications of a handsome increase as the line approaches Lake Michigan and the Sault Ste. Marie. Its business thus far has been in taking lumbering supplies into the woods, transporting men to and from the pineries, hauling railway ties, wood, lumber, etc., with the usual miscellaneous business that would naturally follow. Mills for the manufacture of both pine and hardwood are being put in at several points on the line, and will soon be in condition to furnish a large amount of tonnage to the road, and thus insure a large and increasing business. In regard to extensions next year, Gen. Washburn states that he has already made a contract with Henry & Balch for clearing the right of way, driving piles in the marshes, etc., to the crossing of the Wisconsin River at Rhinelander, thus enabling the company to push forward the construction promptly upon the opening of spring. He concludes his report by stating that there will be no difficulty in making arrangements which will enable the company to go forward next year to the Wisconsin River in any event, and in another season complete that portion of the line lying between the present terminus and the head of Lake Michigan.

Missouri Pacific.—This company gives notices that the first-mortgage bonds of the Missouri River Railroad, maturing Jan. 1 next, will be paid on presentation at the company's office in New York. The amount of these bonds outstanding is $205,0000.

Mobile & Ohio.—The branches from Artesia, Miss., to Columbus, 14 miles, and to Starkville, 11 miles, will hereafter be operated by the Georgia Pacific Co. There is no transfer of the property, but the trains will be run by the Georgia Pacific under agreement and as a matter of convenience.

New York Central Sleeping Car Co.—It is stated that a contract has been concluded by which this company's sleeping cars will replace both the Pullman and the Mann cars on the Wabash, St. Louis & Pacific road. Through sleeping car service will be put on over the Wabash lines from St. Louis, and also from Chicago, over a new route, in this company's cars: that from St. Louis to New York will be from Toledo *via* the Lake Shore and the New York Central, and that from St. Louis to Boston, *via* Detroit, the Great Western of Canada, the West Shore and the Hoosac Tunnel lines. The route from Chicago to both New York and Boston will be *via* Detroit and the West Shore road. This company's cars have already replaced the Pullman cars on the West Shore.

New York, Lake Erie & Western.—It is stated that the contract for the use of the Cleveland, Columbus & Indianapolis tracks between Dayton & Cincinnati has been finally signed. The agreement was negotiated some time ago, and is similar to that heretofore existing between the Erie and the Cincinnati, Hamilton & Dayton.

It is understood that arrangements are being made to run through trains between New York and Scranton, Pa., in connection with the Erie & Wyoming Valley road. This new service will probably not be begun before spring.

It is reported that an agreement has been made by which this company will turn over its Chicago passenger business to the Lake Shore at Buffalo, receiving an equivalent in St. Louis and Indianapolis business, which it will take from the Cleveland, Columbus, Cincinnati & Indianapolis at Marion.

New York & New England.—It is reported that negotiations for the lease of this road to the New York, New Haven & Hartford Co. have been renewed, but no definite information can be obtained from the officers of either company

Northern Pacific.—The work on the Cascade Division is now in progress from the end of the track on the west side to the foot of the mountains, and on the east side on the section of 30 miles, from North Yakima, Wash., to Ellensburg. The contracts for building the tunnel at the summit have been submitted and are now under consideration.

Oregon Improvement Co.—The statement for October and the eleven months of the fiscal year from Dec. 1 to Oct. 31 is as follows:

	October.		Eleven months.	
	1885.	1884.	1884-85.	1883-84.
Earnings	$309,358	$333,129	$2,647,851	$3,108,991
Expenses	203,588	220,051	2,068,650	2,372,380
Net earnings	$105,770	$113,078	$579,201	$736,611

For the eleven months the gross earnings decreased $461,140, or 15 per cent., and the expenses $303,730, or 13 per cent., leaving a decrease of $157,410, or 21 per cent., in net earnings.

Park Point.—This company has filed articles of incorporation in Minnesota to build a railroad from Rice's Point, Duluth, across the Bay of Duluth to Minnesota Point, and thence along Minnesota Point in either or both directions between the village of Duluth and Superior harbor entrance; and, in connection therewith, to own and operate docks, elevators and warehouses upon and along the railroad. The principal place of business is at Duluth. The capital stock is placed at $500,000.

Passaic & New York.—The track is reported about all laid on this road, with the work of ballasting in progress, and trains will probably begin to run over it by Jan. 1. The road extends from Passaic N. J., northeast to a connection with the New York, Susquehanna & Western, and will be operated as a branch of that road. It is 4 miles long.

Portland & Ogdensburg.—In the United States Circuit Court in Concord, N. H., Dec. 15, the final order was filed, making the decree of strict foreclosure absolute. The road now becomes the property of the trustees under the mortgage.

Portland & Shore Line.—It is proposed to build a railroad from Portland, Me., eastward along the ocean beaches, through Cape Elizabeth to Black Point in Scarboro. It will reach a number of hotels and summer resorts.

Richmond & Danville.—At the annual meeting in Richmond Va., Dec. 9, the following resolution adopted at a meeting of the Richmond & West Point Terminal Co. was presented:

"*Whereas* the interest and objects of the proprietors of the Richmond & West Point Terminal Railway Co. are identified with the interest and objects of the proprietors of the Richmond & Danville Railroad Co; and *whereas*, the best interests of the public and the stockholders alike demand the simplest and most economical administration attainable; therefore be it

"*Resolved*, That the board of directors of this company are hereby requested to confer with the Richmond & Danville Railroad Co. with a view of such further unification of interests and management as will best achieve those results."

The resolution was referred to the incoming board.

Rome & Carrollton.—Track on this road is now laid to Cedartown, Ga., the crossing of the East & West Railroad, 20 miles southward from the starting point at Rome. The extension from Cedartown to Carrollton is now being located.

St. Louis & Chicago.—This project has been revived and arrangements made to resume work on the line from Springfield, Ill., by way of Litchfield to East St. Louis. Materials have been bought to lay the track on 10 miles of road graded near Litchfield some time ago.

St. Louis & Emporia.—Track is reported laid from Foster, Mo., west by Mound City and Pleasanton to Kincaid, Kan., a distance of 39 miles. The grading is nearly finished from Foster east to Butler, about 14 miles.

Shreveport & Houston.—In New Orleans last week the United States Circuit Court made an order discharging the Receiver and restoring this road to the company, provision having been made for the discharge of the floating debt. It is stated that the differences between this company and the Receiver of the Houston, East & West Texas road have been arranged and an agreement concluded for the construction of a bridge over the Sabine River at Logansport, which will connect the road and complete the through line from Houston to Shreveport.

Texas & Pacific.—A New Orleans dispatch says that the United States Circuit Court on Dec. 16 appointed Mr. L. C. Sheldon and Mr. John C. Brown, Vice-President of the company, Receivers. The appointment, it is understood, has been made on application of the Missouri Pacific Co., which had a large claim against the road for advances made. At the time the settlement with the bondholders was made, it was supposed that the earnings would be sufficient, with the reduced payments of interest provided for, to put the road in good condition. An examination of the property since that time has made it certain that a much larger amount will have to be raised in order to make necessary repairs to the property, and it was found impossible to raise the amount required on the new terminal bonds. For this reason, it is said, the receivership has been decided on as the best method for preserving the property and applying the earnings to the repair and improvement of the road.

Texas & St. Louis.—The Special Master reports to the Court that the total amount of outstanding bonds and unpaid coupons is $6,200,000. There are $672,000 receiver's certificates, and the other claims allowed for costs, attorneys' fees, etc., amount to $89,100.

Toledo, Ann Arbor & North Michigan.—The repair shops and freight house in Toledo, O., were destroyed by fire on the morning of Dec. 11, with two locomotives and several cars. The loss is estimated at $25,000.

Union Pacific.—In an interview in Chicago this week General Manager Callaway said that there is now in the course of construction a line from North Loup, Neb., to Loup City, a distance of 40 miles. Another line is building from Marysville, Kan., to Garrison, about 42 miles. There is also building a line of 60 miles from Denver to Boulder, Col., and a short line of about 10 miles to Ord, Kan. A line is also constructing from Lincoln, Neb., to Salina, Kan., a distance of 35 miles. All these lines are under contract and are being rapidly pushed toward completion. In addition to these lines the company contemplates the construction of from 200 to 300 miles of new roads in Nebraska and Kansas. President Adams is reporting as saying that the company had hoped to get along without building any branches or extensions this year, but the enterprise of other companies compels them to make an early occupation of desirable tributary country. This is the only reason for present activity, and the several undertakings will be limited to the defensive.

Arrangements are being make to change the Kansas Central Branch, which runs from Leavenworth, Kan., west to Miltonvale, 166 miles, from 3 ft. to standard gauge. The change will probably be made early in the spring.

Wabash, St. Louis & Pacific.—Several cross-bills were filed in the foreclosure suit in St. Louis last week. They were formal bills asking that certain mortgages made by the Great Western, the Wabash and the Illinois & Southern Iowa companies, whose lines are now part of this company's system, be declared liens on those sections of the road which by their terms they respectively cover.

It will be remembered that in May, 1884, the Receivers refused to redeem a large number of tickets from Kansas City, Council Bluffs and St. Louis to Chicago, which were sold at very low rates during the railroad war of 1881 by the company, and which were held by ticket speculators. Several suits arose out of this refusal, the latest one being brought by Mr. Bernard Donnelly, of Kansas City, who held some $10,000 worth of the repudiated tickets. This suit was brought in the United States Circuit Court, and on Dec. 7 the Court delivered an opinion sustaining the Receivers' action, and holding that Mr. Donnelly's claim as owner of the tickets was simply that of an unsecured creditor, and that the Receivers were not authorized either to redeem the tickets or to honor them for passage. This decision sustains and confirms the previous decision of the courts.

Western North Carolina.—On the Western or Murphy Branch of this road, track has been laid from the old terminus at Nantahala, N. C., southward up the narrow valley of the Nantahala River to Jarrett, a distance of 8 miles, the new terminus being 78 miles from Asheville. Work is to be steadily prosecuted on the extension up to the Red Marble Gap, where there is some heavy work. The distance from Jarrett to Murphy is 32 miles.

West Shore.—The following circular from the Accounting Department is signed by J. W. Reinhart, General Auditor, and is dated from his office, No. 280 Broadway, New York, Dec. 6:

"Notice is hereby given that the railway formerly known as the New York, West Shore & Buffalo Railway has been leased from the West Shore Railroad Co., and will be operated from this date as the West Shore Railroad, New York Central & Hudson River Railroad Co., Lessee.

"Foreign lines are respectfully requested to divide their car service and ticket accounts and report as follows: From Dec. 1 to 5, inclusive, to Receivers New York, West Shore & Buffalo Railway, and from 6th to 31st, inclusive, and thereafter to the West Shore Railroad, N. Y. C. & H. R. R. R. Co., Lessee.

"Service material shop and other accounts against Receivers New York, West Shore & Buffalo Railway end as of Dec. 5, and bills for such should be rendered to that date. The receivership having terminated Dec. 5, it is specially requested that all accounts of every nature to that date will be rendered as early as practicable, with a view of closing them without delay.

"Reports, etc., should be rendered to J. W. Reinhart, General Auditor. To further facilitate settlement of accounts of the Receivers New York, West Shore & Buffalo Railway, as soon as it can be done, foreign lines are requested to send to this office a statement of account, in full, to Dec. 5, embracing ticket car service and miscellaneous accounts.

"All remittances to be made on account of the New York, West Shore & Buffalo Railway Co., and the Receivers New York, West Shore Railway, and for all other accounts relating to business before or after Dec. 6, 1885, should be sent to E. V. W. Rossiter, Treasurer, Grand Central Depot, New York, and care should be taken to state the account on which remitted."

Wilmington & Weldon.—This company has purchased the Albemarle & Raleigh road, extending from Tarboro, N. C., eastward to Williamston on the Roanoke River, 33 miles. The terms are not stated. The road will be operated

as an extension of the Tarboro Branch, making the branch 50¼ miles long, from the main line at Rocky Mount to Williamston.

Worcester, Nashua & Rochester.—The stockholders of this company, at the annual meeting in Worcester, Dec. 16, voted unanimously to approve the lease of the road to the Boston & Maine Co., as agreed upon by the directors.

ANNUAL REPORTS.

The following is an index to the annual reports which have been reviewed in previous numbers of the current volume of the *Railroad Gazette*:

	Page.		Page.
Alabama Great Southern	558	Lehigh Valley	52, 464
Ala., N. O., Te. & Pac. June	688	Little Miami	448
Allegheny Valley	559	Little Rock & Fort Smith	544
Alliance, Niles, & Ash	576	Long Island	21
Ashtabula & Pittsburgh	576	Louisiana & Mo. River	527
Atchison, Top. & Santa Fe.	160, 262	Louisiana Western	247
Atlantic & Pacific	448	Louisville & Nashville	560
Atlanta & West Point	496	Maine Central	36
Baltimore & Ohio	7-1	Manhattan	736
Baltimore & Potomac	607	Marquette, Hough. & Ont.	277, 391
Bay View, L. Traverse & Mack.	640	Massillon & Cleveland	576
Belt Ry. of Chicago	431	Memphis & Charleston	527, 800
Boston & Albany	720	Mexican Central	229
Boston, Concord & Montreal	342	Michigan Central	295
Boston, Hoosac T. & West.	151, 560	Mil. L. ke Shor. & Western	263
Boston & Lowell	22	Minneapolis & St. Louis	511
Brunswick & Western	101	Missouri, Kansas & Texas	528
Buffalo, N. Y. & Phila	58	Missouri Pacific	87, 528
Bur., Cedar Rapids & No.	608	Mobile & Girard	496
Camden & Atlantic	167	Mobile & Ohio	793
Canadian Pacific	407	Montpelier & Wells River	480
Carolina Central	310	Nash., Chattanooga & St. L.	624
Central Iowa	215	Natchez, Jackson & Col.	71
Central Pacific	128, 464	New Brighton & New Castle	576
Central Vermont	342	New Castle & Beaver Vy.	576
Charlotte, Col. & Augusta	384	New Haven & Northampton	82
Chartiers	448	N. Y., Chicago & St. Louis.	151, 311
Chesapeake & Ohio	215	N. Y. & Greenwood Lake	407
Chesapeake, Ohio & S. W.	512	N. Y., Lake Erie & West.	768, 783
Cheshire	191	N. Y., N. Haven & Hartford	7
Chicago & Alton	128	N. Y., Ontario & Western	7
Chi. & Atlantic	96	N. Y., Pennsylvania & Ohio	407
Chi., Burlington & Quincy.	183, 228	N. Y. Providence & Boston	71
Chi. & Eastern Illinois	720	N. Y. Railroad Commission	31
Chi. & Grand Trunk	704	N. Y., Susquehanna & Western	359
Chi., Milwaukee & St. P.	101, 167	N. Y., West Shore & Buffalo	7
Chi. & Northwestern	496	Norfolk & Western	86, 311
Chi., Rock Island & Pac.	324, 432	Northeastern (South Carolina)	151
Chi., St. Louis & Pittsburgh	544	Northern Central	135
Chi. St. P., Minn. & Omaha	647	Northern (New Hampshire)	335
Chi. & Western Indiana	431	Northern Pacific	624
Chi. & West Michigan	592	Northwestern Ohio	576
Cin., Hamilton & Dayton	407	Ogdensburg & L. Champlain	479
Cin., Ind., St. L. & Chicago	656	Old Colony	800
Cin., & Muskingum Valley	448	Oregon Ry. & Nav. Co	719
Cin., N. Orleans & Tex. Pacific	183	Pacific Mail Steamship Co.	343
Cin., Richmond & Ft. Wayne	640	Panama	544
Cin. Wash. & Balt. more	688	Pennsylvania Company	575
Cleve., Col., Cin. & Ind	2 3	Pennsylvania & New York	464
Cleve., Lorain & Wheeling	312	Pennsylvania Railroad	150
Cleve. & Pittsburgh	576	Peoria, Decatur & Evansville	214
Columbia & Greenville	4 6	Petersburg	183
Concord	21	Philadelphia & Reading	37, 59
Conn. & Passumpsic Rivers	192	Phila., Wil. & Baltimore	192
Connotton Valley	71	Pitts. & Castle Shannon	128
Cumberland Valley	590	Pitts., Cincinnati & St. L.	448
Del. & Hudson Canal Co.	101, 343	Pitts., Ft. W. & Chic.	342, 430, 576
Del., Lacka. & Western	134	Pittsburgh & Lake Erie	37
Denver & Rio Grande	432	Pitts., Wheeling & Ky.	448
Detroit, G. H. & Milwaukee	704	Portland & Rochester	7
Detroit, Lansing & No.	6 8	Portland & Ogdensburg	263
Eastern R. R. Association	2 3	Pullman's Palace Car Co.	720
East St. L. & Carondelet	576	Richmond & Alleghany	229
East Tenn., Vir. & Georgia	800	Rich. & West Pt. Terminal Co.	263
Eliz., Lex. & Big Sandy	511	Rochester & Pittsburgh	71
Erie & Pittsburgh	576	Rome Wat. & Ogdensburg	7
Evansville & Terre Haute	736	Rutland	479
Fitchburg	23	St. L., Alton & Terre Haute	480
Flint & Pere Marquette	592	St. L., Iron Mountain & So.	528
Florida Ry. & Nav. Co	656	St. L. & San Francisco	249
Fort Worth & Denver City	37	St. L., Vandalia & Terre Haute	198
Galveston, Har. & San Ant.	688	St. Paul & Duluth	134
Galveston, Houston & Hen.	528	St. Paul, Minn. & Man.	575, 647
Georgia Pacific	367	Savannah, Florida & West.	291
Georgia Railroad	24	Seaboard & Roanoke	25 5
Grand Rapids & Indiana	640	Shenandoah Valley	480
Grand Trunk	277, 704	South Carolina	183
Green Bay, Winona & St. P.	623	Southern Pacific (Cal.)	368
Gulf, Colorado & Santa Fe	391	Terre Haute & Indianapolis	198
Hannibal & St. Joseph	656	Terre Haute & Logansport	198
Han. Junc., Han. & Gettysb'g.	391	Texas & New Orleans	247
Hartford & Conn. Western	71	Texas & Pacific	167, 527
Housatonic	167	Toledo, Ann Arbor & N. Mich.	294
Huntingdon & Broad Top Mt.	101	Traverse City	640
Illinois Central	53, 184	Troy & Greenfield	407
Indiana, Bloom & West	751	Union Pacific	160
Indianapolis & Vincennes	576	Utah Central	3 5
International & Gt. Northern	528	Utica & Black River	128
Iron	511	Vicksburg & Meridian	391
Jeff., Madison & Indianapolis	576	Virginia Midland	27
Kan. City, Ft. Scott & Gulf	512	Western North Carolina	247
Kan. City, Spring & Memphis	512	Western Union Telegraph	799
Kan. City, St. J. & Council Bl.	656	West Jersey	687
Kentucky Central	214, 688	Wilmington & Northern	479
Lake Shore & Mich. So.	294, 3 0	Wisconsin Central	432
Lawrence	213, 576	Worcester, Nashua & Roch.	7
Lehigh Coal & Navigation Co.	128	York & Peachbottom	310

New York Central & Hudson River.

The statement of this company to the Railroad Commission for the quarter ending Sept. 30 gives the following balance sheet as of that date:

Assets.

	1884.	1885.
Cost of road and equipment	$145,059,143	$146,074,836
Stock and bonds of other companies	3,241,919	3,472,331
Ownership in other lines, real estate, etc.	6,308,625	6,395,551
Due by agents and others	3,728 179	3,861 106
Supplies on hand	1,383,362	1,220,221
Advances for Harlem construction account	6,726	201,715
Equipment Harlem line	404 394	404,294
Cash on hand	1,491,221	711,998
Total	$162,523,569	$162,342,153

Liabilities.

Capital stock	$89,428 300	$89,428,300
Funded debt	56,497,2 3	56,424,333
Bonds and mortgages on real estate	109 329	107,000
Past due bonds	15,355	67 855
Interest accrued	914,050	879,925
Interest unpaid	7,304	9,179
Dividend payable Oct. 15, 1885		447,141
Unpaid dividends	51,522	67,121
Due for wages, supplies, etc.	1,757,835	2,340 794
Due other roads, etc.	939 244	2,062,170
Profit and loss	12,803.404	10,508.332
Total	$162,523.569	$162,342,153

The earnings and income, as given by the quarterly reports, were as follows for the year:

	1884-85.	1883-1884.	Inc. or Dec.	P. c.
Earnings	$24,429,441	$28,148,669	D. $3,719,228	13.3
Expenses	16,319,372	17,849,313	D. 1,529,941	8.6
Net earnings	$8,110,069	$10,299,356	D. $2 189,287	21.2
Charges	5,933,526	5,630,596	I. 302,930	5.2
Profit	$2,176 543	$4,668,760	D. $2,492.217	53.0
Dividends	3,129,990	7,159,643	D. 4 029,653	57.6
Deficit	$953,447	$2,490,883	D. $1,537,436	61.5

Taxes on property are included in expenses. Charges include interest, rentals and state tax on capital and earnings.

In the current year the amounts received and paid for car mileage are not included in earnings and expenses respectively, as last year, but the excess of payments over receipts, being the debit balance in the account, has been charged to operating expenses.

Boston & Albany.

A summary of this company's report to the Massachusetts Railroad Commission, including the statements of traffic and the balance sheet, has already been published (in the number for Nov. 6, page 720). The report of the company to the stockholders for the year ending Sept. 30 has since been issued, and we take from it the substance of the President's report and other statements. The road worked is as follows:

	Miles.
Main line, Boston to Albany	202
Branches owned	89
Branches leased	83
Total	384

There was no change of mileage during the year.

The statement of earnings and expenses is repeated as follows:

	1884-85.	1883-84.	Decrease.	P. c
Earnings	$7,637 982	$8.148,713	$510,731	6.3
Expenses	5.293,676	5,785.877	492,201	8.5
Net earnings	$2,344,306	$2,362.836	$18,530	0 8
Gross earn. per mile	19.891	21.444	1,553	7.3
Net earn. per mile	6,105	6,218	113	1.8
Per cent. of expenses	69.3	71.0	1.7	...

The income account for the year is stated as follows from report:

Net earnings, as above		$2,344,306
Interest	$662,900	
Rentals	75,000	
Dividends, 8 per cent., on stock other than that held by Co	1,547,804	
		2,285,704
Surplus not divided		$58,602
Surplus, Oct. 1, 1884		61.847
Surplus, Sept. 30, 1885		$120,449

The President's report says: "The saving in expense is $492,201. The receipts have not fallen off for want of traffic. The tons of freight moved and passengers carried one mile exceed the movement of 1884 by 24,209,946; in fact, the business has been heavier than that of any year since the consolidation of the Western and the Boston & Worcester corporations, if the traffic is measured by the ton and passenger mileage. The loss of gross revenue is owing wholly to the ruinous rates at which freight and passengers have been carried between the West and New England. To what extent the company is justified in joining in rates which will not pay the cost of carriage is a grave question for the board to consider. The methods which were used 20 years ago, and which perhaps answered well enough for the business as it then was, are used now, and how inadequate the present system is to deal with the immense traffic of to-day, and the complicated questions which arise from time to time in connection with it, is best shown by the history of the past year. It is almost impossible to conceive of a worse condition of affairs than has existed the past 12 months. That the company has been able to earn its dividend, and at the same time improve the condition of its property, is a matter for congratulation. No charge has been made to the property account except the cost of construction of the Riverside Branch. The payments for all other improvements have been charged to repairs, the items amounting to $235,433.

"An account, running since 1869, between the Boston & Albany and the Eastern railroad companies for the joint use of tracks between Somerville and East Boston has been adjusted by the payment to this company of $83,200. The two companies have agreed to divide the land lying between Somerville and Chelsea now owned in common, the Eastern Railroad Co. taking the westerly half. This company has agreed further to sell to the Eastern Railroad Co. one track now built on the land to be conveyed to it, in consideration of a right of way from East Boston cut to the Grand Junction yard. The company has filed a location between these points, and the tracks are built and in use for about two-thirds of the distance. The Eastern Railroad Co. is building a new track for its own use from Chelsea to Somerville. As soon as this work is completed this company will have tracks of its own from Cottage Farm to the Grand Junction wharves.

"The company has fulfilled its part of the contract with the city of Boston, to separate the grades of Brookline avenue and Beacon street. The abutments were built and iron bridges put in place last winter. It is probable that the city will finish Brookline avenue so that it will be open for public travel this autumn, but no work has yet been done by the street department at Beacon street. It was believed, at the time the last report was made, that the railroad connecting the main line and the Newton Highlands Branch would be finished in August, but the severe winter so delayed the contractors that they were unable to fulfill their obligations. The company has now taken the work into its own hands. It is hardly expected, however, that the line will be open for travel until next season.

"The track and all the property of the company are in excellent condition; 5,079 tons of steel have been laid in the main track, and 4,555 tons of partly worn steel, removed from the main line, have been laid on the branches and in the yards. Mr. P. H. Dudley, with his dynagraph car, accompanied the engineers and roadmasters on their annual inspection of the track. Eleven wooden bridges, 697 ft. in length, in the aggregate, have been replaced by substantial iron structures. There are now but two wooden bridges left in the main line; the iron is already bought for one of these, and the other is a small structure spanning a highway in Pittsfield, just west of the station.

"The improvement and Ware River funds now have a balance to their credit of $938,778."

Central Railroad & Banking Co. of Georgia.

The following statements are from advance sheets of President Raoul's report for the fiscal year ending Aug. 31 last. The lines worked during the year were as follows:

Central Railroad:	Miles.
Savannah, Ga., to Macon	192.0
Gordon to Eatonton	39.0
Augusta Branch, Millen to Augusta	53.0
Total Savannah Division	284 0
Atlanta Division, Macon to Atlanta	102.5
Total Central R. R	386 5
Southwestern Railroad, Macon, Ga., to Eufaula, Ala., and branches	320.0
Eufaula & Clayton R. R.	20 0
Montgomery & Eufaula	80.0
Columbus & Western, Columbus, Ga., to Goodwater, Ala.	89.0
Total	895 5

The company also owns the Savannah, Griffin & North Alabama road, 63 miles; one-half interest in the Western, of Alabama, 138 miles; one-half interest in the Port Royal & Augusta, 112 miles; controlling interests in the Mobile & Girard, 84 miles, and the Upson County road, 16½ miles. These roads do not appear in the report.

The company wholly owns the Ocean Steamship Co., whose lines run between Savannah and New York, and the Central Railroad Bank, which is organized under its charter.

Of the road worked, as stated above, the company owns directly the line from Savannah to Macon and the Atlanta Division, 294.5 miles. The Eatonton Branch, the Augusta Branch (Augusta & Savannah road) and the Southwestern road are leased. The company owns the chief interest in the Southwestern road, and its bonds are issued under a joint mortgage covering that road as well as its own.

The company holds one-half interest in the lease of the Georgia Railroad, 443 miles; the other half being owned by the Louisville & Nashville Co.

The earnings of the company's railroad lines were as follows:

	Earnings.	Expenses.	Net Earnings.
Savannah Division	$1.782 248	$1.105,004	$677,244
Atlanta Division	544.829	423,616	121,213
Southwestern R. R.	947,225	750,060	197,165
Total Central R. R.	$3.274,302	$2,278 680	$995,622
Columbus & Western	171,442	119,455	51,987
Mont. & Eufaula	299 161	157,907	141,254
Eufaula & Clayton	24,544	15,306	9,238
Total	$3,771,449	$2,571,348	$1,200,101
Total, 1883-84	3,713 868	2,544,819	1,169,049
Increase	$57,561	$26,509	$31.052
Per cent of increase	1.5	1.0	2.6

The railroad earnings thus showed a small gain for the year, although circumstances were hardly favorable.

The earnings per mile and the percentage of expenses to gross earnings on the several lines were:

	Earnings per mile.		Net per mile.		Per c. of expenses.	
	1884-5.	1883-4.	1884-5.	1883-4.	1884-5	1883-4.
Savannah Div	$6,276	$6,118	$2,385	$2 378	62.0	61.1
Atlanta Div	5,315	5,463	1,183	1,341	77 7	75 4
S. W. R. R.	2,960	2,864	616	608	79.2	78 8
Total Cent. R. R.	$4,035	$4 540	$1,409	$1.426	69.6	68.7
Col & Western	1,949	1,981	697	697	68.9	64.8
Mont. & Eufaula	3 740	3,743	1,786	1,135	52.8	69 7
Eufaula & Clayton	1,2 7	1,2 6	462	437	62 4	64.1
Total	$4,212	$4,149	$1 340	$1,305	68.2	68.5

The effects of competition are shown by the Atlanta Division, which formerly had heavier earnings per mile than the Savannah Division, but has now fallen much below.

The total income of the company was as follows:

	Earnings	Expenses.	Net Earnings.
Railroad lines	$3,771,449	$2,571,348	$1,200,101
Ocean Steamship Co.			378,908
Central R. R. Bank	140.058	19 275	120,783
Total	$3,911 507	$2,590 623	$1 699,792
Total, 1883-84	3,887,599	2 566 961	1,607,627
Inc or dec	I. $23,908	I. $23.662	D. $107,875
Per cent	0 6	0 9	6.6

In this statement only the net earnings of the Ocean Steamship Company are given in both years. Interest and dividends received on investments are included in the Bank earnings. The decrease in the Steamship Co. net earnings was $108,081, or 22.1 per cent.

The result for the year was as follows:

Net earnings, as above		$1,699,792
Rentals	$444,204	
Interest on bonds	5 6,220	
Interest on certificates of indebtedness	276,000	
Sinking fund payments	115.000	
Dividends, 5 per cent	374.945	
		1 776.369
Deficit for the year		$76,577

The surplus over charges, before deducting the dividend, was $298,368, or a little less than 4 per cent. on the stock.

President Raoul's report says: "Notwithstanding the reduction of the dividends to five per cent on the capital stock, the earnings for the road, together with the income of outside property, have not been sufficient to meet it after providing for the usual fixed charges, and the statement above shows a deficit on the year's operations of $72,266. The policy sought to be carried out by the board was to distribute, as dividends, only such earnings as remained net, after a proper maintenance of the property and the payment of fixed charges; but inasmuch as our fiscal year closes Aug. 31, and under our by-laws whatever dividends are paid must be declared in December or June, the latter declaration occurs when earnings of the last three months of the fiscal year are undetermined, and which cannot always be foretold with accuracy.

"The effort was made, and it was expected to operate the road this year with no greater expense than the year previous, notwithstanding the large reductions effected then to compensate for the decreasing earnings of that year. This would have been approximately accomplished but for the occurrence of three cotton fires during the season—one each at Eufaula, Barnesville and Savannah—and the unexpected culmination this year of a large number of claims for personal injury, many of which originated in previous years.

"The expenditures upon betterments for the past year were $364,103, against $272,309 in 1883-84.

"The Georgia Railroad, although showing, as usual, a constant increase of tonnage, the rates at which it has been forced to work have caused a decline in its revenue. At the close of the fiscal year, March 31, 1885, its receipts had fallen $41,487 short of meeting its rental.

Summing up the results from the operations of this property from the date of the lease, April 1, 1881, the net income over operating expenses has fallen short of meeting the rental $180,025; yet the balance due those interested in the lease amounts to $453,609, because of the fact that all of the earnings were not paid over to the lessees, but a part used for extending the road into Athens, and aiding the completion of the Gainesville Jefferson & Southern Railroad, both of which enterprises were regarded as a prudent business measure.

"The Port Royal & Augusta Railway has fallen off about $10,000 in gross earnings as compared with the last year, but a reduction in expenses has effected a gain in net over last year of $15,237, which secures it a net revenue sufficient to pay its fixed charges.

"In the last report, the floating debt of the company, as represented by bills payable, was shown to be $937,768, but deducting from it the available credits created within that year, the actual debt was, in reality, shown to be $526,682. The floating debt of the present year, as represented by bills payable, amounts to $870,000, but deduct from this the increase in securities and balances on open accounts, the resulting balance will be less than the year previous."

The report remarks that some of the Southern roads have already changed their gauge to the Northern standard of 4 ft. 9 in., and those forming all the direct connections with the Central's lines have determined to do likewise in June, 1886, and arrangements are now being made to effect this change on all the roads controlled by the Central Co. during the month of June next.

"The cost of this change will be considerable, and it is the purpose of your board to endeavor to provide the money from outside sources, and so arrange it as that a portion of the debt thus created may be liquidated each year by absorbing it into the current expense accounts, and thereby prevent this outlay from becoming the cause of an interruption to dividends."